

# The Mining Journal,

## RAILWAY AND COMMERCIAL GAZETTE.

FORMING A COMPLETE RECORD OF THE PROCEEDINGS OF ALL PUBLIC COMPANIES.

[The MINING JOURNAL is Registered at the General Post Office as a Newspaper, and for Transmission Abroad.]

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[WITH SUPPLEMENT.] PRICE SIXPENCE PER ANNUM BY POST, 81. 6d.

**R. JAMES H. CROFTS, STOCK AND SHARE BROKER,**  
No. 1, FINCH LANE, CORNHILL, LONDON, E.C.

Established 1842.  
Business transacted in all descriptions of MINING Stocks and Shares (British Foreign), Banks, Bonds, Railways, Miscellaneous, Insurance, Assurance, Gas, and Dock Shares.  
Business negotiated in Shares not having a general market value.  
Accounts opened for the Fortnightly Settlement.  
Monthly and Daily Price Lists issued.

Bankers: City Bank, London; South Cornwall Bank, St. Austell.  
SPECIAL DEALINGS in the following or any part:—20 Bampfylde, 25s.; 20 Bilson, 50s.; 20 Cardiff and Swansea, 24 10s.; 15 Cedar Creek, 100s.; Chapel House, 6d. (cum div.); 75 Don Pedro, 9s.; 20 Diamond Fuel, 80s.; Glaisdale Quarry, 100s.; 20 Grogwinion, 23 1/2s.; 20 Hooper's Telegraph, 100s.; Malpas, 17s. 6d.; 10 Langdale Chemical, 50s.; Lawes ditto, 25 1/2s.; 50 Live Stock Insurance, 100s.; 50 Nant-y-Glo, 50s.; Newport Abercarn, 24s.; 100 Old Treburgett (ordinary), 8s.; 20 Parys Mountain, 8s. 6d.; 50 Penstruthal, 12s. 3d.; 100 Positive Assurance, 100s.; 20 Rookhope, 10s.; Thorp's Gawber, 23 1/2s. (cum div.); 10 Tankerville, 100s.; 10 Van Consoles, 22s.; 25 West Mostyn, 23 1/2s.; 20 West Tankerville, 22s. 6d.; 100 West Tankerville (paying 6 per cent.), fully paid, 24 2s. 6d.  
Shares sold for FORWARD DELIVERY (one or two months) ON DEPOSIT OF 10 PER CENT.  
SPECIAL BUSINESS in CHAPEL HOUSE COLLIERY shares, yielding at present, upwards of 17 per cent., with every probability of an important increase. JAVALL, OLD TREBURGETT, THORP'S GAWBER, and GLAISDALE QUARRY.

**R. W. H. BUMPUS, STOCK AND SHARE BROKER,**  
44, THREADNEEDLE STREET, LONDON, E.C.

Business in MINING and COLLIERY Shares of every description. Foreign and Colonial Government Bonds, Railways, Banks, and Miscellaneous Shares, and all Securities dealt in on the London Stock Exchange, for INVESTMENT or SPECULATION.  
Purchases and Sales negotiated in Unmarketable Stocks and Shares.  
Speculative Accounts opened for the Fortnightly Settlement.  
References given and required when necessary.

Stock and Share List forwarded to bona fide Investors free on application.

Bankers: The National Provincial Bank of England, E.C.

H. B. has SPECIAL BUSINESS in the undermentioned:—  
Bampfylde, 35s.; 75 Gold Run, 15s.; 50 Rookhope, 13s.; Bog, 15s. 6d.; 25 Ladywell, 22 1/2s.; 15 Roman Grav., 212 1/2s.; Birdseye Crk., 23 1/2s.; 100 Last Chance, 23s.; 100 Malpas, 18s. 6d.; 25 Sweetland Crk., 23 1/2s.; Chapel House Colliery, 43 1/2s.; 30 Marke Valley, 24s. 6d.; 20 So. Condurow, 24 18 1/2s.; Chicago (Silver), 23 1/2s.; 100 Malpas, 18s.; 50 So. Rom. Gravels, 19s.; Cape Copper, 23 1/2s.; 150 Melindur Val. (off w.), 100s.; So. Prince Patrick, 24 1/2s.; Cathedral, 18s. 9d.; 75 No. Prince Patrick, 18s.; 2 Tincroft, 23 1/2s.; Chontales, 10s. 6d.; 25 New Quebrada, 23 13 1/2s.; 10 Tankerville, 22 8s. 9d.; Carn Brea, 250s.; 30 New Consoles, 22 1/2s.; 50 Tecoma, 28s. 9d.; Cedar Creek, 33s. 9d.; 100 Old Treburgett, 8s. 6d.; 100 The Gold, 16s. 6d.; Dolcoath, 24 1/2s.; 50 Prince Patrick, 18s.; 5 Van, 23 1/2s.; Denbighshire, 23 1/2s.; 50 Penstruthal, 13s. 9d.; Devon Consoles, 22 1s. 3d.; 75 Pennerley, 31s. 6d.; 20 W. Great Work, 21s.; East Carson, 23s.; 100 Plynlimmon, 3s.; 40 West Tankerville, 21s.; Eberhardt, 24 1s. 3d.; 40 Prince of Wales, 11s.; 20 W. Grenville, 22 8s. 9d.; East Lovell, 23 1/2s.; 50 Parys Mountain, 9s.; 20 W. Chiverton, 22 8s. 9d.; Flagstaff, 22 1s. 6d.; 60 Port Phillip, 12s.; 5 Wheel Kitty, 25 1/2s.; Frontino, 6s. 6d.; 25 Perkins Beach, 15 Wheel Uny, 23s.; 20 Richmond, 27 8s. 6d.

**MR. E. J. BARTLETT, STOCK AND SHARE DEALER,**  
No. 30, GREAT ST. HELEN'S, LONDON, E.C., has SPECIAL BUSINESS, at the closest prices, in—  
OLD TREBURGETT, MINERA (Buyer), and OLD TALARGOCH, PRINCE PATRICK SHARES.

**JOHN RISLEY (SWORN), STOCK AND SHARE BROKER,**  
77, CORNHILL, LONDON.

Turkish Six Per Cents. of 1854, 1855, 1862, 1865, 1871, and 1873 specially recommended; Wheel Grenville and Treleigh Wood, also Wheel Peavor and Crebor shares.  
Business transacted at the following rates of commission:—Foreign Stocks, 1/4 per cent.; and Mining Shares of £4 each and upwards, 1 1/4 per cent.; under £4, 1s. 6d. share.

**FERDINAND R. KIRK, STOCK BROKER,**  
5, BIRCHIN LANE, E.C.

Consols, Foreign Bonds, Railways, and every security quoted on 'Change bought and sold.  
Bankers: London and Westminster, and City Bank.

SPECIAL BUSINESS in the following:—  
Alami Colliery, Earl's Shipbuilding, New Sharlston, Parnson and Co. Peninsular & Oriental, Fairbairn Engineering, Phosphate Sewage, Brighton Aquarium, Fore-street Warehouse, Richards and Co. Cardiff and Swansea, Foster, Porter, and Co. Silkstone Fall, Chapel House, Hudson's Bay, Thorp's Gawber, Central Swedish, Hooper's Telegraph, Whitehaven, City Offices, Littledean Colliery, West Mostyn, Diamond Rock, Nant-y-Glo, Welsh Freehold, Diamond Fuel, Newport Abercarn.  
OFFERS WANTED FOR:—  
Bagnall, John, Newfoundland Lead, United Bituminous, Britannia Iron, South Cleveland, West Mostyn, Bonville's Court Coal, Silkstone Fall.

**MR. WILLIAM WARD**  
(LATE WARD AND LITTLEWOOD),  
CROSBY HOUSE,  
95, BISHOPSGATE STREET WITHIN, E.C.,  
STOCK AND SHARE BROKER.

**JOHN MOSS AND CO., STOCK AND SHARE DEALERS,**  
224 AND 225, GRESHAM HOUSE, OLD BROAD STREET, LONDON, E.C., transact Business for cash or account on all descriptions of Stocks and Shares.

J. M. and Co. strongly advise the immediate purchase of North Prince Patrick shares, as a great rise is certain. We have just inspected this mine. Report on application.  
Fortnightly accounts opened on advantageous terms.  
J. M. and Co. have BUSINESS in the undermentioned SHARES, at quoted prices, free of commission:—  
40 Bampfylde, 23 1/2s.; 60 Frontino, 8s.; 50 Prince of Wales, 11s.; 30 Birdseye, 23 1/2s.; 100 Gold Run, 15s.; 30 Roman Gravels, 212 1/2s.; 30 Cape Copper, 23 1/2s.; 20 Great Laxey, 23 1/2s.; 25 Richmond, 27 1/2s.; 30 Carn Brea, 250s.; 50 Hington, 23 1/2s.; 20 So. Condurow, 24 18 1/2s.; 40 Chapel House, 44 6s. 3d.; 30 Last Chance, 23 1/2s.; 70 St. David's, 22s.; 40 Chicago, 60 New Rosario, 30 Sweetland, 23 1/2s.; 70 Chontales, 10s.; 40 New Quebrada, 23 1/2s.; 30 Untd. Bituminous, 15 Van, 23s.; 20 Devon Consoles, 22 1/2s.; 100 Old Treburgett, 7s. 6d.; 25 Van Consoles, 22s.; 65 Don Pedro, 11s. 3d.; 75 Parys Mountain, 9s. 6d.; 20 W. Esqair Lie, 22 1/2s.; 25 Eberhardt, 24 1/2s.; 30 Pennerley, 31s.; 20 W. Chiverton, 22 8s. 9d.; 25 Emma, 21 1/2s.; 100 Penstruthal, 12s. 6d.; 50 Whitby Gas, 23 1/2s.; 45 Flagstaff, 22 1/2s.; 60 Prince Patrick.

Circular for February now ready, and can be had on application.  
Bankers: The London and County Bank, Lombard-street.

**MESSRS. A. ENDEAN, FISHER, AND CO., STOCK AND SHARE DEALERS,**  
3, LOMBARD COURT, LOMBARD STREET, E.C.  
Bankers: London and Westminster, Lothbury.

**MR. GEORGE BUDGE, STOCK AND SHARE DEALER,**  
No. 4, ROYAL EXCHANGE BUILDINGS, LONDON, E.C. (Established 25 years), has SPECIAL BUSINESS in—  
50 Chapel House, 100s.; 50 Kingston Valley (Leads), 25 Alltami, 100s.; 100 East Harptree, 50s.; 50 Devon Great Consols, 10 Great Western Colliery, 100 West Tankerville, 30 Bilson and Crump, 110 Cakemore Colliery, 100 Glaisdale Quarry, 50 Welsh Freehold, 10 Van, 125 Ladywell, 30 Wheel Peavor, 70 Gawton, 200 Gold Run, 50 Cedar Creek, 500 Emma, 320 Javall, 250 Frontino, 450 Exchequer, 60 I.X.L., 30 Richmond, 150 Rice, 250 Santa Barbara, 100 Tecoma.

**P. WATSON, STOCK AND SHARE DEALER,**  
79, OLD BROAD STREET, LONDON.

Bankers: The Alliance Bank (Limited); and Union Bank of London.

**MR. ALFRED E. COOKE, STOCK AND SHARE DEALER,**  
75, OLD BROAD STREET, LONDON.

(Established 1853.)

The following shares should be purchased:—  
GLAISDALE QUARRY, at 20s.; dividends expected in a few months.  
CHAPEL HOUSE, at 24 1/2s.; dividends, 15 per cent., declared quarterly.  
THORP'S GAWBER, at 24 1/2s.; dividends, 40 per cent., declared quarterly.  
CAKEMORE COLLIERY, at 25s.; dividends expected in a few months.  
All the above shares are fully paid. Full particulars may be had on application.  
Mr. COOKE guarantees to supply the following shares, or any part:—  
20 Bampfylde, 35s.; 20 Emma, 20 Pennerley, 100 Parys Mountain, 50 Bilson and Crump, 40 Glaisdale, 20s.; 100 Rookhope, 40 Cakemore Colliery, 25 50 Javall, 10 Thorp's Gawber, 20 Cardiff and Swansea, 50 Ladywell, 5 Wheel Peavor, 1 Carn Brea, 5 New Hobbs Hill, 10 Tankerville, 20 Chapel House, 24 6s.; 20 Old Treburgett, 50 West Tankerville, (cum div.) 20 Penstruthal, 10 West Chiverton.  
Shares may be had for settlement at the end of March, subject to the payment of a deposit of 20 per cent.  
Cheques to be crossed Alliance Bank.

**MR. T. E. W. THOMAS, SWORN SHARE BROKER,**  
3, GREAT WINCHESTER STREET BUILDINGS, E.C.

Established 1857.

The following are the latest prices at which business could be done. Where the difference between the buying and selling price is wide transactions may be effected at an intermediate price.

Buyers.		Sellers.		Buyers.		Sellers.	
Bampfylde	2 1/2	2 1/2	13 1/2	Providence	2 1/2	2 1/2	4 1/2
Birdseye Creek	2 1/2	2 1/2	13 1/2	Richmond	2 1/2	2 1/2	7 1/2
Bog	11s.	12s.	12s.	Roman Gravels	12 1/2	12 1/2	12 1/2
Bronfloyd	1 1/2	1 1/2	1 1/2	Rosewall Hill	6s.	7s.	7s.
Carn Brea	40	42 1/2	42 1/2	St. Patrick	1	1 1/2	1 1/2
Cedar Creek	1 1/2	1 1/2	1 1/2	South Condurow	4 1/2	4 1/2	4 1/2
Chontales	10s.	11s.	3d.	South Prince Patrick	1 1/2	1 1/2	1 1/2
Cook's Kitchen	8	8	8	So. Roman Gravels	17s.	18s.	18s.
Devon Great Consols	1 1/2	1 1/2	1 1/2	Sweetland Creek	2	2 1/2	2 1/2
Ding Dong	5 1/2	5 1/2	5 1/2	Tankerville	9 1/2	9 1/2	9 1/2
Dolcoath	42 1/2	45	45	Tincroft	23	25	25
East Lovell	6 1/2	6 1/2	6 1/2	United Mexican	3	3 1/2	3 1/2
Eberhardt	4 1/2	4 1/2	4 1/2	Van	23	23 1/2	23 1/2
Emma	2 1/2	2 1/2	2 1/2	Van Consoles	1 1/2	2	2
Flagstaff	2 1/2	2 1/2	2 1/2	West Basnet	6 1/2	6 1/2	6 1/2
Gold Run	12s.	14s.	14s.	West Chiverton	5s. 6d.	5s. 6d.	5s. 6d.
Javall	8s. 6d.	9s.	9s.	West Maria	19s.	21s.	21s.
Ladywell	2 1/2	2 1/2	2 1/2	West Tolgus	64	66	66
Marke Valley	23s.	24s.	24s.	Wheel Grenville	4 1/2	4 1/2	4 1/2
New Consoles	1 1/2	2	2	Wh. Kitty (St. Agnes)	4 1/2	4 1/2	4 1/2
Parys Mountain	8s.	9s.	9s.	Wheel Peavor	5	5 1/2	5 1/2
Pennerley	1 1/2	1 1/2	1 1/2	Wheel Uny	2 1/2	2 1/2	2 1/2
Penstruthal	12s.	13s.	13s.				
Prince of Wales	7s. 6d.	9s. 6d.	9s. 6d.				

**WILLIAM BARTLETT, STOCK AND SHARE DEALER,**  
FINSBURY SQUARE BUILDINGS, LONDON, E.C.

Business transacted in British, Colonial, and Foreign Securities, Railway, Bank, and Mining Shares at close net prices. The Sale or Purchase of Shares not quoted in the usual Stock and Share Lists may be negotiated.

Full particulars of a few Securities well worthy of immediate attention will be forwarded on application, free of charge.

**MESSRS. PYNE AND ASHMEAD,**  
CITY MINING AGENTS,  
LONDON MANAGEMENT OF COMPANIES UNDERTAKEN.  
ACCOUNTS AUDITED, LIQUIDATIONS CONDUCTED.  
GOOD CENTRAL OFFICES.  
6, BISHOPSGATE STREET WITHOUT, LONDON, E.C.

**MESSRS. W. J. TALLENTIRE AND CO.,**  
STOCK AND SHARE BROKERS.

20, CHANGE ALLEY, CORNHILL, LONDON, E.C., transact business in Stock Exchange Securities and Mining Shares of every description.  
A Selected List of Safe Investments forwarded to intending investors post free upon application. Fourteen years' experience.

**MESSRS. ENDEAN AND CO., STOCK AND SHARE DEALERS,**  
85, GRAVESEND STREET, LONDON, E.C.

Government and every negotiable Stocks dealt in for cash or account. Order and telegrams punctually attended to.  
We advise immediate application and purchase of the BAMPFYLDE and LANSWAT shares. A rise in price is inevitable.

**G. E. SIMPSON, STOCK AND SHARE DEALER,**  
6, GREAT WINCHESTER STREET BUILDINGS, LONDON, E.C., will

SELL THE FOLLOWING SHARES, free of commission:—  
50 Almada, 15s. 9d.; 50 Gold Run, 13s.; 15 Roman Grav., 212 1/2s.; 30 Bampfylde, 23 1/2s.; 70 Javall, 9s.; 25 Sweetland Crk., 23 1/2s.; 25 Birdseye Creek, 23 1/2s.; 45 Ladywell, 22 1/2s.; 20 Tankerville, 22 8s. 9d.; 30 Chontales, 11s.; 5 Van, 23 1/2s.; 5 Van, 23 1/2s.; 40 Pennerley, 31 1/2s.; 20 W. Chiverton, 22 8s. 9d.; 75 Cleo Hill, 7s.; 40 Rosewall Hill, 7s.; 20 W. Grenville, 22 1/2s.; 20 Emma, 21 1/2s.; 20 Richmond, 27 1/2s.; 15 Wheel Kitty, 24 1/2s.

**MR. W. MARLBOROUGH, STOCK AND SHARE DEALER,**  
29, BISHOPSGATE STREET WITHIN, LONDON, E.C. (Established 18 Years), will sell the following SHARES, at prices annexed:—

40 Bampfylde, 33s. 6d.	30 Emma, 21 1/2s.	5 Roman Gravels, 212 1/2s.
20 Birdseye Creek, 23 1/2s.	20 Flagstaff, 22 1/2s.	25 Rosewall Hill, 6s. 9d.
5 Bog, 11s. 6d.	50 Gold Run, 13s. 6d.	30 S. Roman Grav., 17s. 9d.
2 Carn Brea, 243s.	60 Javall, 9s.	10 Tankerville, 22 8s. 9d.
5 Cockle Kitchen, 8s.	20 Ladywell, 22 1/2s.	2 Van, 23 1/2s.
50 Chontales, 11s. 3d.	50 Parys Mountain, 9s.	20 Van Consoles, 21 1/2s. 9d.
2 Dolcoath, 24 1/2s.	25 Pennerley, 31 1/2s. 3d.	50 West Maria, 6s. 3d.
30 Devon Consoles, 21 1/2s.	10 Prince of Wales, 9s. 6d.	20 W. Tankerville, 22 8s. 9d.
10 East Lovell, 6s. 12s. 6d.	5 Providence, 24 1/2s. 6d.	10 W. Grenville, 22 1/2s. 9d.
20 Eberhardt, 24 1/2s. 6d.	15 Richmond, 27 1/2s.	5 Wheel Kitty, 24 1/2s.

**MR. THOMAS THOMPSON, JUN., 1, PALMERSTON BUILDINGS,**  
BISHOPSGATE STREET, LONDON, E.C.

Some valuable hints as to the purchase of mining shares will be found in Mr. Thompson's "Investment Circular" for February now ready, post free, price 6d.

**MR. JAMES STOCKER, 2, CROWN COURT,**  
THREADNEEDLE STREET.

Railway, Bank, Foreign Bonds, and all other Stocks and Shares for Investment or Speculation.

SPECIAL BUSINESS in the following:—  
50 Almada, 15s.; 80 Glaisdale, 17s. 6d.; 25 Rom. Gravels, 212 1/2s.; 50 Bampfylde, off wtd. 55 Great W. Van, 10s. 3d.; 60 Rio Tinto, 29 1/2s.; 5 Bellavista, off wtd. 30 Grogwinion, 75 Richmond, 27 1/2s.; 25 Birdseye, 22 1/2s. 3d.; 50 Gawton, 100 Roca, 5s. 9d.; 30 Bilson & Crump, 210 1/2s.; 15 Hudson's Bay, 40 Silkstone Fall, 70 Blue Tent, 25s.; 20 Hton Rbyn, 38s. 9d.; 100 South Aurora, 12s. 6d.; 50 Bog, 12s. 6d.; 200 Javall, 9s. 6d.; 55 So. Carn Brea, 23s. 9d.; 10 Cape Copper, 100 Kilbreth, off wtd. 30 So. Rom. Grav., 17s. 9d.; 4 Carn Brea, 243 1/2s.; 20 Lawes' Chem., 25 1/2s. 3d.; 5 St. J. del Rey, 30 Thorp's Gawber, 213 1/2s.; 45 Cedar Creek, 32s. 6d.; 40 Last Chance, 23s. 9d.; 80 Tecoma, 28s. 9d.; 40 Central Van, 40 Ladywell, 22 1/2s.; 100 Tylwyd, 29s.; 40 Chontales, 11s.; 50 Malpas, 16s. 3d.; 150 United Bitum., 6s. 9d.; 30 Chicago, 23 1/2s.; 55 Malabar, 12s. 3d.; 40 Van Consoles, 41s.; 40 Cleo Hill Col., 6s. 6d.; 30 Marke Valley, 24s.; 45 Welsh Freehold, 22 1/2s.; 70 Chapel House, 44 1/2s.; 100 New Rosario, 7s. 6d.; 10 Tincroft, 23 1/2s.; 25 Cardiff & Swan., 24 1/2s.; 25 New Consoles, 43s. 9d.; 40 Van Consoles, 41s.; 75 Don Pedro, 9s. 9d.; 45 New Sharlston, 25 1/2s.; 20 Newcastle Che., 23 1/2s.; 15 West Chiverton, 47s. 6d.; 20 Devon Gt. Con., 41s. 6d.; 100 Old Treburgett, 8s. 3d.; 55 Penstruthal, 12s. 6d.; 55 W. Esqair Lie, 35s.; 20 Emma, 23 1/2s. 9d.; 50 Pennerley, 21 1/2s.; 70 Wheel Coates, 32s. 6d.; 20 Eberhardt, 24 1/2s. 9d.; 50 Providence, 24 1/2s.; 15 W. Grenville, 22 1/2s.; 20 East Lovell, 6s. 12s. 6d.; 70 Prince of Wales, 9s. 3d.; 80 Wheel Peavor, 25 1/2s.; 60 Frontino, 8s. 6d.; 100 Port Phillip, 13s. 9d.; 15 Wheel Kitty, 25s.; 110 Gold Run, 15s. 9d.; 30 Rookhope, 11s. 9d.; 50 Wheel Uny, 23 1/2s.

Bankers: London and Westminster.

**MR. CHARLES THOMAS,**  
MINING AGENT, STOCK AND SHARE DEALER,  
3, GREAT ST. HELEN'S, LONDON, E.C.

**MESSRS. A. W. THOMAS AND CO.,**  
10, COLEMAN STREET, E.C.

MINING AGENTS, AND STOCK AND SHARE DEALERS.

St. Patrick Mining Company.—Prospectuses and plans may be obtained upon application to Messrs. A. W. Thomas and Co.

TO INVESTORS.

**MESSRS. PENNINGTON AND CO.'S "MONTHLY RECORD OF INVESTMENTS,"** published on the first Thursday in each month, contains an exhaustive Review of the British and Foreign Stock and Share and Money Markets, &c., with an enumeration of safe investments, paying from 10 to 20 per cent. Price 6d. per copy, or 6s. annually.

PENNINGTON and Co., Sworn Brokers, 3, Royal Exchange-buildings, E.C.

**MR. HENRY CHAPMAN, STOCK AND SHARE DEALER,**  
WOOL EXCHANGE, COLEMAN STREET, LONDON, E.C.

(Established 20 years.)

Business transacted in every description of Securities including British, Foreign, and Colonial; also Railways, Banks, Insurance, Miscellaneous, and Mining Companies.

Holders of Mining Shares can obtain, free of charge, particulars of the exact position of any company they may be interested in.

Buyer of any part of 500 Lovells at 15s.; 1000 Patent Ligno Mineral Paving Shares. All enquiries answered by return of post.

**MR. HENRY MANSELL, STOCK AND SHARE DEALER,**  
14, GREAT WINCHESTER STREET, LONDON, E.C.

Deals in all descriptions of Stocks and Shares at close market prices.

**MR. W. TREGELLAS, 122, BISHOPSGATE STREET WITHIN, E.C.,**  
Deals in all descriptions of Stocks and Shares at close market prices.

**MESSRS. HARLAND AND CO., STOCK AND SHARE DEALERS,**  
235 and 236, GRESHAM HOUSE, LONDON, E.C.

Bankers: London and County Bank.

Messrs. H. and Co. wish to direct attention to the DIVIDENDS declared by CHAPEL HOUSE and ALLTAMI COLLIERIES, and will be happy to supply shares in these companies at market rates.

**MESSRS. HARVEY, JORDAN, AND CO.,**  
MINING AGENTS, ACCOUNTANTS, AUDITORS,  
MANAGERS OF PUBLIC COMPANIES, &c.

OFFICES,—30, MOORGATE STREET, LONDON, E.C.  
LONDON OFFICES OF THE LLANTHISTANT TIN PLATE WORKS.

MESSRS. HARVEY, JORDAN, AND CO. undertake personally the INSPECTION OF MINERAL PROPERTIES, the MANAGEMENT OF COMPANIES entirely, or partially by keeping the accounts at their offices, or by periodical visits to the properties; AUDITING OF ACCOUNTS, ARBITRATIONS, &c.

Mr. HARVEY, of the above firm, having to VISIT the UNITED STATES and CANADA early in February on Special Business, is PREPARED to UNDERTAKE on the same journey OTHER COMMISSIONS to INSPECT and REPORT on MINERAL PROPERTIES, and furnish reliable information.

**MESSRS. J. TAYLOR AND CO., 86, LONDON WALL, E.C.**  
and MINING EXCHANGE, SOUTH KING STREET, MANCHESTER,  
MINING ENGINEERS AND INSPECTORS.

Business done in all descriptions of Stocks and Shares.

**MR. E. CHARTERS, 36, NORTHUMBERLAND STREET,**  
CHANCERY CROSS, LONDON, can do BUSINESS in the FOLLOWING SHARES, free of commission:—

50 Almada, 15s. 3d.	30 Green Hurth, 24 1/2s.	60 Rossa Grande, 2s.
25 Bampfylde, 23 1/2s.	20 Gunnislake, 21 1/2s.	50 Trumpet Cons., 21s.
20 Marke Valley, 24 1/2s.	20 Marke Valley, 24 1/2s.	5 Tincroft, 22s.
10 Birdseye Creek, 23 1/2s.	50 Malabar, 12s. 6d.	30 Van Consoles, 21 1/2s.
2 Carn Brea, 247s.	25 Malpas, 16s. 3d.	70 West Maria, 5s. 6d.
20 Cardiff & Swan., 23 1/2s.	50 New Fowey Con., 10s. 6d.	10 West Basnet, 26 1/2s.
50 Devon Consoles, 21 1/2s.	30 New Sharlston, 25 1/2s.	20 Wheel Kitty, 25s.
20 Emma, 21 1/2s.	30 Old Talargoch, 22s.	10 Wheel Peavor, 25s.
80 Frontino, 6s. 6d.	50 Plynlimmon, 2s. 3d.	30 Wheel Jane, 25s.
50 Gawton, 9s. 6d.	50 Pedn-an-drea, 27 1/2s.	30 Wheel Uny, 23s.
20 Glasgow Carad., 21 1/2s.	40 Rosewall Hill, 6s. 6d.	10 Wheel Allen, 10s. 6d.

**MR. TIMOTHY HUGHES,**  
59, SEEL STREET, LIVERPOOL.

The Registered Office of the PRINCE PATRICK, GROSVENOR, WEST BRYN CELYN, and GREAT EAST FOXDALE LEAD MINING COMPANIES (LIMITED).

Full information respecting these Mines forwarded on application.

RELIABLE INFORMATION given respecting Mines in the Isle of Man, Flintshire, and the neighbouring districts.







two blast-furnaces; two forges, with three high forge rolls; two rotary squeezer; two three-high rail mills—one for iron and one steel; and everything as complete and efficient as possible, alike as to minimizing labour and permitting no waste.

At St. Louis there was an ironworks which had been laid down by an Englishman, which was as good nearly as it was 25 years ago, and this same Englishman, who went out from Cleveland—and in doing so never, in Mr. Molineux's opinion, made a greater mistake in his life—had designed no inconsiderable portion of the ironworks machinery of the States.

Upon calling at Ohio Falls Ironworks, at New Albany, near Louisville, when his name was announced the manager, who was an Englishman, named Dangerfield, told him that he was at that moment reading an account in an American paper of a new furnace that he (Mr. Molineux) had just put up at his works at Moxley. Now, that news from the date at which the fact was published in this country had travelled faster than he had himself, and he mentioned the fact to show how watchful an eye the American iron and steel masters were keeping upon what was being done in those industries in the Old Country.

Works at Cincinnati, at Youngstown, at Johnstown, and elsewhere were described, and much significance attached to the Cambria Works, at Johnstown, with its four blast-furnaces, its forty-six double puddling-furnaces, and its admirable and extensive steel-making and steel-working appliances. Space will not, however, allow us to do more now than to add that, whilst Mr. Molineux is profoundly impressed with the vast strides in iron and steel making and manipulating which the Americans have made in the past 25 years, still he does not despair of an excellent business being possible with them for a long time to come. They have, he says, much overdone the work of preparing to meet the American demand, and they have done this at a very heavy first cost. With moderate prices in England the British ironmaster, Mr. Molineux believes, may safely calculate on keeping the United States as one of his customers. The two greatest difficulties with which the iron and steel producer of America has to contend are dear labour, and, to some of the native markets, expensive land carriage. Illustrative of the cost of labour in the States, he pointed out that at the time the puddlers in this country were being paid the very high and unexampled figure of 12s. 6d. per ton, puddlers in America were being paid nearly twice that sum; and he showed that a roller who had three hoop-mills in his care was from that source netting 1000s. a year, and was, moreover, the owner of a much-used livery stable.

Relative to the expense of carriage to some of the American markets, Mr. Molineux does not think that it costs much if any more to carry iron from some of the British ironworks across the Atlantic to New York than it does to take iron from Pittsburgh to that market.

A prohibitive tariff is what, in his opinion, English iron and steel masters have most to fear, but he does not believe in the probability of such a duty. He speaks most highly of the frankness with which American iron and steel makers everywhere, with one solitary exception, throw open to him the whole of their works. "We have," he said, "no secrets, and we will give you any explanation you need." The exception was that of some steel works which certain manufacturers from Sheffield had started near to Philadelphia. But even to those works he might, perhaps, have obtained admission if the proprietors had not been away. Specimens of the sheets, hoops, and horse-nails and the like which he picked up at random in passing through the works Mr. Molineux showed to the Association, and they were pronounced of much excellence. As he deserved to be, the author was very warmly thanked for his excellent paper, which bristled with facts from beginning to end, and was in no respect discursive.

#### THE BRITISH CHEMICAL TRADE—ITS PAST, PRESENT, AND FUTURE—No. III.

The two principal seats of the alkali trade of Great Britain are Lancashire and Tyneside. Both of these localities have been largely associated with the development of other industries, but they are recognised as *par excellence* the most distinguished centres of this industry. It is easy to understand how, apart from the stimulus that was given to the expansion of this trade on Tyneside by the superior energy and chemical skill of its pioneers, it should have found a home on the banks of the coal river. From no port in the United Kingdom is it possible to obtain a better command of the European markets, while the same facilities are attainable in the importation of the raw materials. In the first beginnings of the chemical trade of the Tyne it was usual to get the sulphur ore almost exclusively from Sicily. On this ore until 1825 there was an excise duty of 15s. per ton; but in that year the excise was reduced to 10s. per ton, making the cost of the ore delivered on the Tyne from 6s. to 8s. per ton. In 1838, however, the King of Sicily entered into an arrangement with Messrs. Faix and Co., of Marseilles, for the exclusive acquisition of all the sulphur ore produced in his dominions; and this was the first impulse leading the chemists of this country to make use of pyrites as a substitute for sulphur. For some time all the pyrites required was found in ample abundance in Cornwall and Ireland; but in 1856 attention began to be given to the importation of Spanish pyrites, which were found to be more rich in sulphur, and subsequently pyrites were imported from Westphalia, Norway, and Belgium. Spain, however, still continues the main source of supply. At the present time the imports of sulphur ore into the Tyne are greater than those of any other commodity except iron ore. Nothing could more fully illustrate the rapid growth of the chemical trade of the Tyne than the fact that the imports of sulphur ore had increased from 68,248 tons in 1869 to 124,537 tons in 1873, the quantity imported having thus nearly doubled within four years. The establishment on the Tyne of works for the smelting of copper by the Tharsis and the Bede Metal Extracting Companies have had much to do with this development, which, however, has also been stimulated in no small measure by the splendid resources of the Tharsis Company, and the unequalled facilities they have offered for the importation of sulphur ore. The total quantity of raw materials imported into the Tyne for the purposes of the alkali trade of that river is calculated at over half a million tons, including, in addition to pyrites and sulphur ore, a large quantity of chalk, brought from the cliffs of Dover, or from Rouen, in France, manganese, and nitrate of soda. Of salt, it is computed that nearly 250,000 tons are now annually employed for the same purposes, while of limestone it is estimated that the quantity annually used is not short of 230,000 tons.

There is a very interesting history attached to the first employment of salt in the chemical trade of the Tyne. It happened in this wise:—A salt spring was found in the neighbourhood of Walker, in 1796, in the shaft of a coal pit, which had been sunk there as far back as the year 1788. On June 24, 1798, a lease was signed with the Corporation of Newcastle for the exclusive use of this salt spring, and an agreement was entered into with the owners of Walker Colliery to pump the brine. To do this a 4-in. lead pipe was put down on the outside of the metal tubing of the pit to the salt spring, and an engine erected by Bolton and Watt, in 1788, on the principle of the "sun and planet motion," did the double work of drawing both the brine and the coal. At this time there was an excise duty of 10s. to 36s. per ton on salt; and it is related that it was a common practice of the working classes about Walker, owing to the scarcity and dearth of salt, to bore holes in the wooden spouts, and convey the brine secretly to their dwellings for domestic purposes. Although the high duties on salt were not repealed until 1823, the Earl of Dundonald, who was associated with the late Mr. Losh in the establishment of the Walker Alkali Works, succeeded in obtaining an Order in Council declaring that the salt made at Walker might be used in the manufacture of soda free of duty; but, to prevent its being used for domestic or other purposes, it was required that soot or ground coal should be put into the pans. At the outset of the manufacture not more than 2 or 3 tons of salt were produced per week, and at no time while the local brine was used did the quantity produced exceed 8 tons. It was not until 1825 that Cheshire salt was imported, and, as it only cost 12s. to 13s. per ton, as against 33s. to 34s. expended in the evaporation of the salt brine at Walker, the latter was soon superseded by the former. Until very recently the ordinary Cheshire salt was almost exclusively used for the ma-

nufacture of alkali, the only exception being a manufactory where the waste heat of the coke-ovens is used for the evaporation of the liquor formed by dissolving rock salt. In the early half of the present century extensive salt-works were carried on at Shields, and the quality of Shields salt was admittedly superior to any other; but the conditions of its manufacture were so unfavourable that it has now all but become utterly extinct. The cost of freight for the conveyance of the salt from Cheshire to Tyneside would be very considerable were the railway system alone made use of; but the bulk of the salt used on Tyneside is conveyed thither by canal to Hull, Goole, or Grimsby, and thence by foreign vessels, which take it as ballast, to the Tyne, when they come to that river for an outward cargo of coals. Inasmuch as salt is one of the most important and essential elements entering into the manufacture of alkali, it is worth while to reflect on the prospects of Tyneside, so far as the future supply of this and other raw materials are concerned. It was calculated in 1863 that the production of salt in this country was not less than 1,500,000 tons per annum, of which only 120,000 tons were rock salt. Since then, however, fully half a million tons more has been added to the annual output of salt, and the distance between rock salt and salt produced by evaporation has been very materially diminished. Cheshire is at the present time the only important centre of the salt trade in the kingdom; but there is a limit to the quantity of salt even in Cheshire, and there are many who aver that before many years that limit will be attained. In the North of England it is now found that it does not pay to make salt by the evaporation of seawater, the day having gone by when the small coal required for that purpose cost the salt manufacturers no more than the expense of conveying it to their works by river craft. Shields salt is still made in very small quantities by first dissolving Cheshire or Irish rock salt in sea-water, and then evaporating the brine by the waste heat of coking-ovens. A Mr. Wilkinson, resident on Tyneside, introduced some years ago a process whereby the waste heat of coke-ovens was employed in the evaporation of brine; but it was not followed out with commercial advantage, the same objection being applied to this as to all other attempts made to utilise the waste heat of coke-ovens—that it interfered with the primary object of producing coke.

The following tabulated statement exhibits the production of salt in Cheshire for the last ten years, distinguishing rock salt from white:

For the year ending	Rock salt. Tons of 28 cwt.	White salt. Tons.	Total. Tons.
March 31, 1864	58,030	695,555	753,585
" 1865	53,000½	670,781½	723,782
" 1866	48,278	736,775	785,053
" 1867	50,572	721,423	772,175
" 1868	49,759	868,679	918,438
" 1869	58,696	901,565	960,262
" 1870	67,410	901,158	968,568
" 1871	52,765	930,551	1,013,316
" 1872	91,054	996,331	1,087,385
" 1873	95,429½	918,068	1,013,497½

It will be observed that Cheshire attained its maximum production in 1872, when it produced 1,087,465 tons. The production of Worcestershire is very inconsiderable, Droitwich only yielding 120,000 tons, and Stoke Prior 150,000 tons; while Ireland does not produce more than 20,000 to 30,000 tons per annum. From neither of these sources would it be reasonable to expect large accretion of supply available for the alkali trade of Tyneside; and it is, consequently, gratifying to view the near prospect of that trade becoming altogether independent of supplies so extraneous and so costly. Within the last few years a bed of rock salt has been discovered at Middlesbrough, by the firm of Messrs. Bolckow and Vaughan. Its analysis showed the following composition:—

Chloride of sodium	98.43
Sulphate of lime	3.09
Sulphate of magnesia	0.08
Sulphate of soda	0.10
Silica	0.06
Oxide of iron	0.04
Moisture	0.04—100.00

This salt was first pierced at a depth of 1206 ft., the bed being not less than 99 ft. thick. Messrs. Bolckow and Vaughan did not, however, pursue their interesting and valuable discovery to its logical and commercial result, and it has been allowed to slumber undisturbed up to the present time, the firm having probably already too many irons in the fire to undertake the development of quite a new industry. This, however, was not the view which occurred to Messrs. Bell Brothers, of the Clarence Works, on the opposite banks of the River Tees, for, after prospecting on their property upwards of twelve months, they recently came upon the same bed of salt at almost the same thickness, and now intend to take steps for its development. The fact of possessing so near at hand, and in apparently inexhaustible quantities, a supply of salt so well suited for their requirements will be a great gain to the alkali manufacturers on the Tyne. It has been calculated that Tees salt can be delivered on Tyneside for 2s. to 3s. per ton less than the salt of Cheshire, and this is a consideration of the utmost importance to firms like the Newcastle Chemical Company, Tennant and Co., Lomas and Co., H. L. Prtinson and Co., and others on the Tyne, each of whose works decompose from 20,000 to 50,000 tons of salt per annum. From this point of view, therefore, the chemical trade of the Tyne has a bright outlook. But this is not all. The unlimited command of salt on the one hand, and of cheap fuel on the other—for the Tyneside alkali manufacturers can obtain better and cheaper coal than any rival or competitor, no matter where established—will give the Tyneside alkali trade a better hold on the markets of Northern Europe, so that, instead of now exporting as we do a large quantity of coal and salt for the alkali industries of other countries, we may hereafter extend our exportation of the finished articles of commerce.

It is not unfrequently made a subject of wonder that the alkali trade of Great Britain should have become concentrated so exclusively on Tyneside and in Lancashire. The latter district we shall leave for the present out of the question, but with reference to the former there is little to wonder at when all things are duly considered. It may startle some readers of the Journal to hear that the Tyne has a more extensive shipping connection than any other port in the United Kingdom, and this is just another way of saying that its shipping trade is second to none in the world. No fewer than 19,101 vessels cleared from the Tyne ports in 1872, as compared with 13,724 vessels clearing from Liverpool, and 18,248 vessels clearing from London. Many of these vessels are glad to have the opportunity of bringing back chalk and clay from the Continent as ballast, so that it is delivered on the Tyne at a merely nominal freight. Then, again, the alkali manufacturers of Tyneside are never at a loss in picking up vessels suitable for their purpose when they require to charter a cargo. They have a splendid navigable highway at their doors, by which they can find an easy path to all the principal European markets, and we need not say here that much of the alkali produce of the Tyne is consigned to the Continent.

Taking these considerations, therefore, into account, along with the more obvious advantages already indicated, it will at once appear that Tyneside will long continue to sway the sceptre of the alkali trade of this country.

**CHEMICALS, MINERALS, AND METALS.**—(Messrs. J. Berger Spence and Co., Feb. 17).—Soda: Cream caustic, 60 per cent., 13s. 6s. to 13s. 10s.; white, 14s.; soda ash, 23-16d.; soda crystals, 5s. 7s. 6d.; bi-carbonate, 14s.; salt cake, 3s. to 3s. 2s. 6d.; Glauber salts, 2s. 17s. 6d. to 3s. Bleaching Powder: At 9s.—Alum: 7s. 10s. to 7s. 15s. for loose lump; ground, 8s. 10s. to 8s. 15s.—Nitrate of Soda: At 12s. to 12s. 3d.—Ammonia: Sulphate, white and grey, 17s. 12s. 6d. to 18s. 5s.; carbonate, 7s. 6d.; muriate, 3s. to 3s. 10s.; sal ammoniac, firsts, 45s.; seconds, 44s.—Potash: Muriates, 80 per cent., at 6s. 10s. to 6s. 12s. 6d.; L.O.B.; Prussiate, red, 2s. 6d.; yellow, 1s. 2d.; chlorate, 10s. 6d.; bi-chrome, 6s. 6d.—Iron Salts: Green and rusty coppers, 60s. loose; in casks or barrels, 65s.—Copper Salts: Sulphate of copper, 26s. 10s.—Litharge: Best flake, 26s.—Sugar of Lead: Brown, 28s.; ditto, white, 43s. to 44s.—Saltpetre: Foreign, 22s. to 22s. 6d.; refined, 28s. to 28s. 6d.—Acid: Tartaric, English, at 1s. 6s. 6d.; foreign, 1s. 6s. 6d.; oxalic, 6s. 6d.; sulphuric, 3s. 10s. to 3s. 15s.; carbolic, No. 1, 11d.; picric acid, 2s. 2d. per lb.—Arsenic: 14s. to 14s. 6s.—Magnesia: Epsom salt, 8s. 17s. 6d.; refined, 4s. 10s.—Benzole: 30 per cent., 50 per cent., 4s. 6d. to 5s.; 90 per cent., 5s.—Brimstone: Best thirds, 7s. 10s.—Phosphate of Alumina, 3s. to 3s. 10s. per ton.—Pyrites: Spanish cupreous, 7s. 6d.; non-cupreous, 9d. to 9s. 6d.—China-clay: 18s. f.o.b. Cornwall; best quality, 28s.—Phosphates: High strength, 80 to 85 per cent., 1s. 4d. to 1s. 5d. per unit; Extremadura, 1s. 3d.; ordinary, 60 per cent., 1s.; precipitated phosphate of lime, 70 per cent., 5s. 5s.; super-phosphates, 80 per cent., soluble, 3s. 6d. per unit; 25 to 26 per cent., 3s. 10s.—Manganese: Ores, 110s. to 115s. for 70 per cent.—Iron Ore: Hematite, 15s. to 22s. 6d.; puddling, 24s. to 27s.; celtic, 5s. to 10s.—Iron: "Ayrshire" Yorkshire pig-iron, delivery, January to March: No. 3, 60s.; No. 4 (foundry), 67s. 6d., net cash, or 1s. extra four months' bills; Scotch pig warrants, 73s. to 74s.; Staffordshire bars, 9s. 12s. 6d.—Copper: Chili bars, 83s. to 84s.—Tin: Eng-

lish ingot, 96s. 10s.; Straits, 91s.; Australian, 90s.—Tin-Plates: M.I.C., 25s. 3d. per box.—Lead: Best English soft pig, 23s. 10s. to 23s. 15s.—Antimony: French Bar, 53s. to 54s.—Spelter: Silesian, 23s. 15s.—Sheet Zinc: N. 6, 51s. 15s.; N. 7, 50s. 15s.; N. 8, 29s. 6s.; N. 9, 28s. 15s., c.i.f. Hull or Liverpool.

#### QUALITATIVE AND QUANTITATIVE ANALYSIS OF NICKEL, COBALT, AND SILVER ORES, BY THE USE OF THE BLOW-PIPE.\*

By HUGO COOKESLEY, Author of the "Practical Assayer."

##### No. I.—QUALITATIVE ANALYSIS OF NICKEL AND COBALT.

I design to give to the readers of the *Mining Journal*, in three or four short articles, an account of the ingenious, elegant, and accurate methods of determining the value and presence of the three above-mentioned minerals. It so happens, curiously enough, that, although these assays—nickel, cobalt, and silver—when they are performed in the laboratory require complicated and cumbersome apparatus, such as muffles, reducing furnaces, &c., yet can be most accurately determined by means of a blow-pipe and a few pieces of apparatus that can be easily carried in a coat-pocket, and whose weight does not exceed a few ounces. Indeed, a good practitioner can estimate the value of a silver ore quite as accurately by means of the blow-pipe as he can by the muffle, incredible almost as this statement may appear to those who are not acquainted with the method of assay. I have no doubt, then, that a description of these assays will prove extremely useful to persons interested in cobalt or silver mining property, especially to those who are at some distance from large towns. I have omitted all descriptions of apparatus, as I presuppose my readers are acquainted with the different kinds already. The word "coal" means charcoal.

The assay of nickel and cobalt ores, though of great importance, is, unfortunately, of great difficulty. All the wet processes are tedious and uncertain in their results, and require special re-agents, which are very often difficult to procure in remote districts. The mode of assay now to be described is that known as "Plattner's Dry Method," and is the best, cheapest, and most accurate, when properly performed. I imagine that it is little known in England, as in a review by the *Chemical News* on my book, the "Practical Assayer," in which an account of it was given, to a certain extent only, as suitable for explorers, it was stated that "we cannot see the utility of the assay or its accuracy"—or words to that effect. It may be stated broadly that the method depends on the property that nickel and cobalt possess of coloring borax in a melted state; if, therefore, we can, by successively getting rid of other metals combined with them, determine the exact duration of the colouration of the borax beads, we can by calculation determine their respective values.

**I.—QUALITATIVE ANALYSIS.** This is best performed with the blow-pipe. The following are the principal minerals in which nickel and cobalt occur. The compositions are the result of calculation, and not of special analyses, which are not of general use, and are only of value for particular cases.

Granatite, Ni 22, Bi 10, S 32. Millerite, Ni 65, S 35. Copper nickel, Ni 44, As 56. Breithauptite, Sb 69, Ni 31. Chloanthite, Ni 28, As 72. Gersdorffite, Ni 36, As 54, S 19. Ullmannite, Ni 28, with antimony and sulphur. Annabergite, Ni O 37, As O 39. Emerald nickel, Ni O 59.

Smaltine, Co 35-28, As 70-90, Fe 1-18, Ni 0-5-26. Cobaltine, As 45, Co 36. Skutterudite, Co 21, As 79. Linneite, S 42, Co 58. Erythrine, Co O 38, As O 38.

These metals also occur in the various speisses obtained by smelting cobaltiferous nickel ores.

Cobalt is easily recognised, since it oxidises very readily, and imparts a blue colour to the borax bead, which remains unaltered in the oxidising and reducing flame. Suspected compounds of cobalt with arsenic must be fused on a piece of coal until all the arsenic fumes are driven off. If only cobalt is present, a small piece of glass of borax, placed on the top of the powdered mineral, and melted with the tip of the blow-pipe flame, will be coloured pure smalt-blue. If, however, iron is present, the glass of borax will be coloured yellow to brownish red in the oxidising flame. But by cleaning off the borax, when saturated, and adding a fresh piece, or pieces, the smalt-blue colour will at length appear. Any copper or nickel which may be present will combine with the remaining arsenic and sulphur, and will not be oxidised until the cobalt has come off, by repeated additions of borax. This point may be determined by lifting a small portion of the melted borax with a pair of pincers, and squeezing it out flat; by holding it up to the light any brown shade, caused by the presence of nickel, can be at once seen. By adding fresh borax, and treating the button with the oxidising flame as before, the nickel can be slagged off, and if any copper is present it can be determined by the borax bead assuming a green colour both when hot and cold. If any bismuth is present it will be immediately recognised by the coat which it will form on the piece of coal used for removing the excess of arsenic. This coat is dark orange-yellow when hot, and lemon-yellow when cold, the part furthest from the flame being almost white. It may be readily distinguished from the coat from lead ores by its not colouring the reducing flame—the lead coat colours it azure-blue. Sulphides must be also roasted until they cease to yield anything volatile. Before metallic nickel can be tested for cobalt it must first be converted into an arsenide, by mixing it, in the shape of filings, with a little metallic arsenic, and fusing the mixture on a piece of charcoal with a reducing flame. When the button is fused, if cobalt is present it will tinge a small piece of borax blue when melted with the tip of the blue flame, as described above. A very small quantity of oxide of nickel, however, cannot so easily be detected by the above simple process. Suppose, for instance, that we wish to know if nickel is present in an iron ore that reacts for cobalt as well. We dissolve two or three separate portions in glass of borax, and then place all the beads together in a small coal crucible, and add a piece of pure gold leaf, weighing about 1 grain; the gold and beads are fused together with a strong reducing flame until all the nickel is reduced from the beads and collected in the gold button, which has been brought into contact with every portion of the fused borax glass. When the button has solidified it is lifted out, and freed from the adhering glass by a blow from a small hammer. A very small amount of nickel will render the gold button more or less grey. If this button is now treated on a piece of charcoal with fresh borax, if nickel is present the characteristic reddish-brown colour will immediately appear on the application of the oxidising flame, if no cobalt was reduced, owing to the borax glass not being supersaturated with the oxides of iron and cobalt; if, however, cobalt has been reduced, it will oxidise first and colour the glass blue, as stated above. If there were any copper present, of course it will combine with the gold as well, as copper has a great affinity for gold, and the bead, if treated with salt of phosphorus on charcoal, will remain green on cooling; if, however, there was no nickel at all in the ore the glass when cold, as well as the melted lead itself, will appear bluish-green; the button, also, when cool appears of a bright surface. We thus see that the order in which the principal metals oxidise is—iron first, cobalt second, nickel third, and copper last. It is of great importance to the miner and mining engineer to know the chief points by which the principal ores of nickel and cobalt may be recognised; I have, therefore, tabulated the above-mentioned list of minerals according to Plattner's "Probirkunst," giving their behaviour before the blow-pipe.

**GRUNANITE.**—In the open tube yields sulphurous acid and a slight yellowish coat, formed by sulphate of bismuth, which settles near the assay. On coal it evolves sulphurous acid, and fuses to a grey button, which subsequently gives a yellow coat of oxide of bismuth and a white coat of sulphate. If the residue is powdered and treated with borax glass, besides cobalt, copper, and iron, it reacts strongly for nickel.

**MILLERITE.**—Yields sulphurous acid in the open tube. On charcoal it fuses easily to a globule; but it spits violently, and decreases in size. If roasted and treated with a strong reducing flame, a somewhat malleable metallic and magnetic mass results. Very often a little copper and iron are present.

**COPPER NICKEL.**—When free from antimony yields very little

\* From the *German of PLATTNER*.



arsenous acid in the closed tube, but in the open tube yields arsenous acid abundantly, and sometimes sulphurous acid; the substance turns yellow-green. On charcoal it fuses to a button, giving off arsenical fumes. If the button is treated with a little borax glass with the tip of the blue flame the colours of iron and cobalt will be discovered. Sometimes a yellowish-white coat of bismuth is formed.

**BREITHAUFITE.**—In the open tube copious antimonial fumes are given off; the substance appears of a greyish-green when cool. It can be fused on a piece of charcoal in the reducing flame, and when the blow-pipe action is stopped fumes like those of antimony are given off, but no oxide of antimony is formed; but on turning on the blast again a coat of oxide of antimony is formed, and a little beyond it a yellow lead coat may be formed if that mineral is present. If the substance by itself gives off no arsenic odour, this becomes perceptible by adding a little soda. The glass obtained with borax on coal with the reducing flame only reacts for iron, but by treating the button with a little fresh borax the brown reaction of nickel is seen.

**CHLOANTHITE.**—Behaves like copper nickel, but in the closed tube metallic arsenic is formed.

**GERSDORFITE (Nickel Glance).**—Decrepitates in the closed tube, and yields a yellowish-brown sublimate of sulphide of arsenic. Arsenous and sulphurous acids are yielded in the open tube. On coal fuses to a button, giving iron, cobalt, and nickel reactions.

**ULLMANNITE.**—In the closed tube yields a small white sublimate; in the open tube copious antimonial fumes. On charcoal fuses to a button, giving off antimonial fumes, which give the characteristic coat. Sometimes arsenic is present, and can be recognised by its smell.

**ANNABERGITE.**—In a small matrass yields water, and becomes darker. It can be fused with the tip of the blue flame, and gives a light-blue tinge to the outer flame, due to arsenic. When treated with the reducing flame on charcoal arsenical fumes are evolved, and a blackish-grey globule of arsenide formed, which generally shows a feeble cobalt reaction in the reducing flame, but afterwards shows nickel in the oxidising flame.

**EMERALD NICKEL.**—Assumes a black colour in a small matrass, and yields considerable water at 100° C. On charcoal in the oxidising flame it is unchanged, but in the reducing turns to a metallic infusible powder, which is magnetic, and assumes a metallic lustre by friction in an agate mortar. With soda in the oxidising flame is insoluble, but in the reducing flame is easily reduced to a quantity of white metallic particles, which are magnetic. With borax or a piece of looped platinum wire in the oxidising flame the hot glass is violet, but reddish-brown when cold. In reducing flame the borax becomes grey or opaque, owing to finely-divided metallic nickel. The reduction is best made with a small piece of tin on charcoal; the metallic particles unite with the tin to a button.

**SMALTINE.**—In the closed tube yields metallic arsenic. When carefully treated in the open tube a copious crystalline sublimate of arsenous acid is formed. When pulverised it becomes changed into basic arsenate of cobalt. It can be fused on coal to a greyish-black magnetic button with evolution of arsenic fumes; this button is brittle, and when treated with borax on charcoal shows cobalt, nickel, and iron reactions.

**SKUTTERNDITE.**—In the closed tube gives a very strong sublimate of arsenic, and in other respects behaves like arsenic.

**COBALTINE (Cobalt Glance).**—In the closed tube yields a very little arsenous acid. In the open tube when heated to redness it yields arsenous and sulphurous acids. On charcoal it gives off arsenic and sulphur, and finally fuses to a button, giving with borax, nickel, and iron reactions.

**LINNEITE.**—In the closed tube yields a sulphur sublimate; in the open tube a great deal of sulphurous acid, and very little arsenous acid. When pulverised it turns black on cooling. On coal small fragments of crystal can be fused in the reducing flame to a globule, which can be kept fluid for some time free from oxide on the surface, and no coat formed. When cold it is covered with a patchy black film of oxide of iron.

**ERYTHRINE.**—In the small matrass yields water only. The ruby crystals from this ore glow in the matrass, and when cooled are of a dirty violet colour. In the blow-pipe flame these crystals gradually fuse, and colour the flame light-blue. On coal arsenical fumes are given off, and in the reducing flame a blackish-grey globule of arsenide of cobalt is formed, which with the fluxes reacts only for cobalt.

In my next article I shall describe the method for quantitatively determining the value of nickel and cobalt ores.

#### THE COAL RESOURCES OF OUR COLONIES—No II.

Sir C. Dilke, in his "Greater Britain," well observes, "The position of the various stores of coal in the Pacific is of extreme importance as an index to the future distribution of power in that portion of the world, but it is not enough to know where coal is to be found without looking also to the quantity, quality, cheapness of labour, and facility of transport. Tasmania has good coal, but no great quantity, and the beds nearest to the coast are formed of anthracite. The three countries of the Pacific which must, for a time at least, rise to manufacturing greatness are Japan, Vancouver Island, and New South Wales, but which of these will become wealthiest and most powerful depends mainly on the amount of coal which they respectively possess, so situated as to be cheaply raised. The dearth of labour under which Vancouver suffers will be removed by the opening of the Pacific Railroad, but for the present, New South Wales has the cheapest labour, and upon her shores at Newcastle are abundant stores of coal of good quality for manufacturing purposes, although for sea use it burns 'dirty' and too fast. The future of the Pacific shores is inevitably brilliant, but it is not New Zealand, the centre of the water hemisphere, which will occupy the position that England has taken on the Atlantic; but some country such as Japan or Vancouver, jutting out into the ocean from Asia or from America, as England juts out from Europe. If New South Wales usurps the position it will not be from her geographical position, but from the manufacturing advantages she gains by the possession of vast mineral wealth."

The coal field of NEW SOUTH WALES is estimated at 120,000 square miles, and in Queensland the same area is supposed to exist. This great coal field of New South Wales is found to extend into Queensland, and to reappear in Tasmania. The coal measures reach from the 29th to the 35th parallel of south latitude; they crop out to the water's edge along many miles of the seaboard, and vast carboniferous areas are intersected by two lines of railway, at distances of nearly 100 miles from the metropolis, while the third line, that to the north, runs through coal fields over nearly its whole length. The New South Wales coal is admirably adapted for steam purposes. It is burnt in all the steamships trading to the southern hemisphere, and meets the English coal in the markets of India and China, at equal prices. The principal collieries at present worked are situated within 10 miles of Newcastle, a commodious harbour, about 50 miles north of Sydney; but valuable mines are also worked near Wollongong, 60 miles south of Sydney, and at Hartley, about 90 miles inland on the western line of railway. The Australian Agricultural Company's seam is 163 ft. from the surface, and 150 ft. below sea-level, and its average thickness is about 10 ft. It is highly bituminous, and may be taken as an illustration of several other seams in the same locality, which are, however, nearer the surface. Preparations are being made to work a seam near Murrumbidgee, 120 miles north-west of Newcastle; and efforts are also being made to bring the coal of the Clarence into the local market.

A large area of the New South Wales coal fields must long remain undeveloped, except for local requirements, for it is not likely that mines far inland will ever be able to compete with those only a few miles from the ports of shipment. Locomotive power is used at all the Hunter River mines, and with the shipping facilities which exist in Newcastle at the present time they are able to load 40,000 tons of coal per week. The means of shipment can, of course, be indefinitely increased. The late Mr. William Keene, examiner for coal fields, in a report to the Colonial Government, says, "I have examined some more than 700 miles to the north of Newcastle, belonging to the same deposits as we are working on the Hunter, covered and underlain by the same fossil flora and fauna; and we may, without

boasting, claim to rank with the most extensive coal fields in the world." The Hartley coal measures are the last which have been brought under tribute by the miner, and in a year or two their trade with the western interior must become very great. The coal measures there are close to the railway, and they are known to crop out over an area of 10 square miles. The seams are from 9 to 11 ft. thick, and the coal is used by the locomotives on the Government railway. The area under lease for coal mining, up to the end of 1872, was 34,720 acres; and the number of coal miners 2150. The prices of coal at Newcastle f.o.b. are—best screened, 12s.; unscreened 11s.; small 6s. The miners are paid 4s. 3d. per ton for hewing coal; they work by the piece, but seldom labour more than eight hours, and in that time can average 3 tons. The quantity of coal raised from New South Wales mines to the end of 1872, was over 10,000,000 tons, of which more than 6,000,000 tons were exported, of the value of four millions sterling.

In QUEENSLAND the area over which coal is spread is estimated at more than half of the superficial extent of the whole of England; but little has yet been done towards the development of its coal mines. The area is, therefore, very large, occupied by the carboniferous formation of the colony, in which seams of coal of varying thickness and quality are known to exist. At Tivoli, Redbank, and Allora, in the neighbourhood of Warwick and Ipswich, as well as on the Burrum river, in the Maryborough district, some few coal seams have been, and still are, worked, but for the present in these localities only. The great extent of the Queensland coal formation and the number of included seams of that mineral, with accompanying iron ores, induce the belief that there will hence ultimately arise one of the main sources of employment for a large settled population. The Redbank coal pits are near Ipswich, 20 miles from Brisbane. The coal seam is situated on the Brisbane river, near the junction of that river with the Bremer.

In VICTORIA coal seams exist at Traralgon, Gipps Land, Cape Patterson, Griffith's Point, Coal Creek, Bass river, and other places in the coal rocks, along the coast of Western Port, also in the Barrabool Hills, near Geelong, in the Cape Conway ranges, and at Coleraine, in the Portland district. Most of the seams vary between a few inches and 1 foot in thickness; only a few exist at Cape Patterson and Griffith's Point, of a thickness exceeding 3 ft. These are, however, as far as mining exploration has proved, not of any great workable extent. The coal from some of the seams is of very good average quality, that from Griffith's Point and Cape Patterson resembling mostly "pitch," or "caking coal." Some seams, as at Traralgon, yield a mineral both in chemical composition and outward character hardly distinguishable from Virginian bituminous coal. It is bright black, rather hard, with small conchoidal fracture, burns readily with bright yellow flame, and yields a good firm coke. This and the Cape Patterson coal prove very good gas coals. The working of the Cape Patterson coal seams has for several years been repeatedly attempted, but with only poor success hitherto. Although the mineral is of quite as good quality as that of Newcastle, New South Wales, still it cannot compete with the latter in cheapness, a circumstance mainly due to the absence of good roads or tramways for easy access from the mines to the seaboard, combined with the want of harbour accommodation to ship coal to the Melbourne market.

Bituminous shales are found associated with, and generally covering, the coal seams. They consist of black or brown slaty and shaly beds, full of carbonaceous and bituminous matter. Most of these shales burn, though somewhat sluggishly, under the influence of a good draught. Brown coal or lignite also occurs in extensive deposits in several parts of the colony. One at Lal Lal, nearly 120 ft. in thickness, is perhaps unparalleled in any part of the world. In WESTERN AUSTRALIA coal is found, but not yet worked, on the Irwin river, in the Victoria district, but also on the southern coast, near the Fitzgerald river. It is of the character of Welsh coal, well adapted for engine purposes.

#### GOVERNMENT INSPECTION OF COAL AND METALLIFEROUS MINES.

[OFFICIALLY CORRECTED.]

Subjoined is a list of the districts in charge of the several Inspectors of Metalliferous Mines; and of the Inspectors of Coal Mines, with the assistant inspectors and secretaries of the Boards of Examination.

- METALLIFEROUS MINES.**
- 1.—MR. CLEMENT LE NEVE FOSTER, D.Sc., Truro:—Cornwall, Devonshire, Somersetshire (except Bristol district), Dorsetshire.
  - 2.—MR. T. F. EVANS, Amlwch, Anglesea:—Derbyshire, Shropshire, Cumberland, Lancashire (except those mines in the coal field), Durham and Northumberland, North Wales, Cardiganshire, Radnorshire, Merionethshire, Carnarvonshire, Brecknockshire, Montgomeryshire, Denbighshire, Flintshire, Anglesea, Isle of Man.
  - 3.—JAMES P. BAKER:—South Staffordshire and Worcestershire.
  - 4.—MR. THOS. WYNN, Gnosall, Stafford:—Staffordshire.
  - 5.—MR. JOSEPH DICKINSON, Pendleton, Manchester:—Cheshire, Ireland, and within the coal field of North and East Lancashire.
  - 6.—MR. W. ALEXANDER, 23, India-street, Glasgow:—Scotland, West.
  - 7.—MR. T. E. WALES, Brunswick-place, Swansea:—Pembrokeshire, Carmarthenshire, Glamorganshire, Clifton, Bristol:—Somersetshire (Bristol district), Gloucestershire, Herefordshire, Monmouthshire, and Wiltshire.
  - 8.—MR. THOS. EVANS, Duffield-road, Derby:—Oxfordshire, Northamptonshire, and Warwickshire.
  - 9.—MR. THOMAS BELL, Durham:—The Dales district of North Yorkshire and
  - 10.—RALPH MOORE:—Eastern district of Scotland.

- COAL MINES.**
- (A.L., Assistant Inspector; SEC. B.E., Secretary to Board of Examination.)
- 1.—MR. JAMES WILLIS, Newcastle-on-Tyne; A.L., Mr. W. N. Atkinson, 10, Gloucester-terrace, Newcastle-on-Tyne; SEC. B.E., Mr. Geo. Southan, 17, Wentworth-terrace, Newcastle-on-Tyne:—Northumberland, Cumberland, and Durham north of the Wear.
  - 2.—MR. THOMAS BELL, Durham; A.L., Mr. J. B. Atkinson, Chilton Moor, Fence Houses; SEC. B.E., Mr. G. W. Bartlett, Cleveland-parade, Darlington:—Durham south of the River Wear in its course from the sea at Sunderland up as far as Harston, near Chester-le-Street, and from thence westward, the line of the Pontop and Shields branch of the North-Eastern Railway, Cleveland in Yorkshire, and Westmoreland.
  - 3.—MR. FRANK N. WARDELL, Wath-on-Deane, near Rotherham; A.L., Mr. John Gerrard, Wakefield; SEC. B.E., Mr. J. R. Jeffery, solicitor, Bradford:—Yorkshire and Lincolnshire.
  - 4.—MR. THOS. EVANS, Pen-y-Bryn, Duffield-road, Derby; A.L., Mr. A. H. Stokes, Derby; SEC. B.E., Mr. W. Saunders, 42, Full-street, Derby:—Derby, Nottingham, Warwickshire, and Leicester.
  - 5.—MR. THOS. WYNN, Gnosall, Stafford; A.L., Mr. Samuel B. Gilroy, Stone; SEC. B.E., Mr. Jos. Knight, Newcastle-under-Lyme:—North Staffordshire, Shropshire, and Cheshire.
  - 6.—MR. JAMES P. BAKER, Tettenhall, Wolverhampton; A.L., Mr. W. B. Scott, Compton-road, Wolverhampton; SEC. B.E., Mr. Wm. Blakemore, Heath Town, Wolverhampton:—South Staffordshire and Worcestershire.
  - 7.—MR. JOSEPH DICKINSON, Pendleton, Manchester; A.L., Mr. J. S. Martin, Freestwich, Manchester; SEC. B.E., Mr. W. M. Peace, King-street, Wigan:—North and East Lancashire, called the Manchester district, and Ireland.
  - 8.—MR. HENRY HALL, Rainhill, Prescott; A.L., Mr. John L. Hedley, 3, Elm Vale, Fairfield, Liverpool; SEC. B.E., Mr. W. M. Peace, 19, King-street, Wigan:—West Lancashire, the Wigan and St. Helen's districts, and North Wales.
  - 9.—MR. LIONEL BROUGH, 11, West Mall, Clifton, Bristol; A.L., Mr. Thos. Cadman, Newport, Monmouth; SEC. B.E., Mr. J. T. Thomas, Coleford:—Monmouthshire, Gloucestershire, Somersetshire, parts of Glamorganshire, and Breconshire.
  - 10.—MR. THOMAS E. WALES, Brunswick-place, Swansea; A.L., Mr. William Galgway, Swansea; SEC. B.E., Mr. C. H. James, 8, Courtland-terrace, Merthyr Tydfil:—South Wales coal field.
  - 11.—MR. RALPH MOORE, Rutherglen, Glasgow; A.L., Mr. J. T. Robson, Cambuslang, Glasgow; SEC. B.E., Mr. Robert Calder, 249, Renfrew-street, Glasgow:—Scotland: Eastern Division, including East Lanarkshire, Fifehire, Clackmannanshire, Haddingburghshire, Edinburghshire, Linlithgowshire, East Stirlingshire, &c.
  - 12.—MR. Wm. ALEXANDER, 23, India-street, Glasgow; A.L., Mr. John M. Ronaldson, 14, Apsley-place, Glasgow; SEC. B.E., Mr. C. Macpherson, 116, St. Vincent-street, Glasgow:—Scotland: Western Division, including Ayr, Dumfries, Dumbarton, West Division of Stirling, and part of Lanarkshire.

**FUEL.**—MR. R. HODSON, C.E., of the Thames Ironworks Company, Blackwall, has patented an improved mode of utilising sawdust and shavings. The invention consists in burning sawdust and shavings (the latter being first disintegrated to bring them to a state of sawdust). The furnace being charged with a continuous stream of such fuel by the impelling force of a blast of air he is enabled to keep up an intense fire suitable for generating steam and for calcining mineral substances.

**EPPE'S COCOA—GRATEFUL AND COMFORTING.**—"By a thorough knowledge of the natural laws which govern the operations of digestion and nutrition, and by a careful application of the fine properties of well-selected cocoa, Mr. Eppe has provided our breakfast tables with a delicately flavoured beverage which may save us many heavy doctors' bills. It is by the judicious use of such articles of diet that a constitution may be gradually built up until strong enough to resist every tendency to disease. Hundreds of subtle maladies are floating around us ready to attack wherever there is a weak point. We may escape many a fatal ailment by keeping ourselves well fortified with pure blood and a properly nourished frame."—Civil Service Gazette.

#### Original Correspondence.

##### ROCK DRILLS.

SIR,—We ask again the privilege of your columns to reply to the letters of "Mine Agent" and "A Working Miner," in your last issue.

When we had finally perfected such boring machines and appliances for the varied circumstances of mine work as proved to be thoroughly efficient, durable, and economical, we presumed the first to adopt such machinery would be the old-established paying mines and new enterprises starting with fair capital, the managers of which would be disposed to use improved modern appliances. We thought that the application of compressed air as a motive power, and the advantage resulting from its use for underground operations, was sufficiently understood to warrant the conclusion that those who would profit most by the use of the means would soonest employ them. In such view of the case it would be the greatest economy to put down at once the compressor of a capacity that would answer to certain future requirements. Also the manufacturers who had made a specialty of that kind of machinery had till then been mainly occupied with the construction of large machines for extensive tunnel and other work, so that the practical application of the system on a large scale was quite conclusive. The pure air was a good thing to send down into the mine, at all events; and it did not imply the purchase and use of more than one rock-drill till that one should have shown the desirability of procuring others of the same kind, or of some other system.

Again, the adoption of the boring plant in its simplest manner—working several machines simultaneously—is comparatively less expensive than mounting machines singly. With a carriage adapted for several machines there is less hand manipulation, and more powerful machines can be employed with equal facility. The employment of the boring machines in this way does not imply destruction and renewal of the appliances for mounting, as such part of the plant may be considered indestructible. Also the machine proper as to its principal material parts is durable, and does not require removal or renewing repairs any more than a steam-engine (to which your correspondent likens it) requires renewal when some slight repairs or renewal of insignificant parts may be required.

Your correspondent speaks of a driving for six men to work by hand, and we will presume that may be an ordinary or a frequent class of driving. Now, where six men can work at a face, either each man striking his separate drill, or three or four being strikers, as the case may be, there is abundant room to work six powerful boring machines, and employment for double the number of men. And this is the true plan for making the greatest progress and the greatest economy.

The advantages over hand labour are to be gained in this order:—1. A simple means of mounting a single-light machine, or two machines, capable of being placed or removed by hand, but requiring more or less frequent shifting. 2. The use of a carriage suited for four or six machines, providing the support or *point d'appui* for attacking the face from various positions by simply changing the machine from one place to another successively on the carriage, thereby obtaining the angle and direction of holes required, and thus avoiding the loss of a part of the time in manipulation. 3. Having the full complement of machines in place on the carriage, and in case of insufficient power, changing the flexible tubing from one machine to another successively. 4. Having a sufficient power to drive the six machines simultaneously. The adoption of the one machine to take the place of the six hand workers may be considered the first long step in advance, and the other arrangements mentioned are successive shorter steps, to be availed of or not, as may be deemed expedient. To carry on in either way the successive operations of driving is as perfectly simple and easy for the commonest sort of mining workmen as can be imagined, and they could only be affected by better wages and employment for more of them.

At the St. Gothard Tunnel, where day wages are in general much lower than in this country, the men can make from 8s. to 12s. per month, and British miners with equal facilities would earn more. To arrive at the greatest progress, double the number of men are employed which could possibly be occupied advantageously if the work were being prosecuted by hand labour. For sinking pits the advantages over hand labour are equally great, and less boring plant required. Fewer machines are employed, and these are worked from stands or stretchers, with the greatest simplicity of manipulation.

So much has been said about the mine captains, agents, and managers, it would doubtless be very amusing to examine a series of their photographs. Some illustrated paper should furnish a group of these famous functionaries for the satisfaction of the interested mining public.—London, Feb. 18. MCKEAN and Co.

#### RAILWAY ACCIDENTS, AND THEIR CAUSE.

SIR,—Being much engaged at present upon the subject of railroads and railway brakes, and having paid some attention to the evidence given by several of the engineers at the inquest on the Shipton accident, I cannot help saying that some of them gave the most erroneous answers ever given by sane men. For instance, one when asked where he would place the brake van when making up a train, said by all means at the front; another said it might be put anywhere in the train. Now, Sir, just let us see what would be the effect of this when a train is going up a steep gradient with the brake van in front should any of the couplings break. The whole train would be dashed to pieces, and yet with this danger before their eyes they give this unaccountable evidence. I say that any man making up a train in this way would be guilty of manslaughter in the event of a fatal accident occurring.

Let us look at a train of eight or nine carriages running at full speed, and we see at once a chain drawn out very tight. Now as long as you hold on to the rear end of this chain no harm can take place, because if you put on the brake it is simply holding the chain a little tighter till the train comes to rest, and there can be no jerk anywhere in doing so. But suppose you place the brake in front, what will happen then? Why, simply one carriage will crush that in front of it, and kill the passengers, or jump off the rails and roll down the embankment. My own opinion is that the cause of the Shipton accident was that the engine stopped the first carriage too suddenly. Of course there is every allowance to be made for a man acting on the spur of the moment, but still all ought to understand that the brake at the rear of the train should do all the work. A good deal is said just now about continuous brakes, but I should prefer a brake or two if required always at the very rear. By this the chain of carriages remains unbroken, which is the great principle of safety.—James-street, Feb. 19. JOHN WALKER.

[For remainder of Original Correspondence see this day's Supplement.]

**ENGINEERING COLLEGE IN JAPAN.**—As an example of what a Government engineering college should be, we cannot do better than cite the institution at Tokyo, in Japan. The Japanese Government are in just the same position as that of India. They want engineers, and they have established a college to supply them. The calendars of this college for 1873 and 1874 lie before us, and they contain a great deal that is eminently suggestive. The Imperial College of Engineering was established at Tokyo in 1873, "under the orders of the Minister of Public Works, with a view to the education of engineers for service in the Department of Public Works." All the students are Japanese, and all the professors are British. The principal is Mr. Henry Dyer, C.E., M.A., University of Glasgow, while the professors of natural philosophy, mathematics, chemistry, drawing, and English literature are all men of high attainments. At the end of the calendar for 1874 examples of the examination papers are given, and, although these are easy enough, it reflects no small credit on students who have acquired their information through the medium of a foreign language—English—that they appear, on the whole, to have passed with much credit to themselves and their instructors. The course of training will extend over six years. During the first four years six months of each year will be spent at college, and six months in the practice of that particular branch which the student may select. The last two years of the course will be spent wholly in practical work. The system of instruction will be partly what is usually called professorial and partly tutorial, consisting in the delivery of lectures, and in directions and assistance being given to the students in their work. Can anything be better than this, or more likely to produce the class of men that is wanted? We regret still more that English youths have no such facilities for learning their profession as those afforded by the Japanese Government. The cost of the student's education, maintenance, and clothing is defrayed for six years, the student binding himself, in return, to give his services as an engineer to the Government for seven years, dating from the time at which he leaves the college.—Engineer.



COOK'S KITCHEN MINING COMPANY.

WEST FRANCES MINING COMPANY.

he known shoots of ore as they advance. They purpose driving the 20 west shortly in order to prove the shoot of ore westward. The lode in the 20 west has improved, and is producing good jack and kindly spar. He thinks they may expect lead here shortly. This is an encouraging point. The stopes in back of 80 will produce on an average 1½ ton of lead per fathom. The best and most encouraging report that he can write just now is that they expect to meet their costs for January and February months.

### FOREIGN MINES.

There is no doubt of the superintendent's desire to 'make the property a success; added to his inclination may be cited his experience here of two years or more. Constant familiarity with property enables one to discover its salient points, and to take advantage of same. With skilful and active handling the property for the ensuing year, and for the future, should pay all expenses of working

Warne's engine shaft the lode is large, open, and easy for driving, and yields 2 tons lead ore per fathom. In the 85, west of Crosby's shaft, the ground is hard, and the lode small. The same level on the south lode has become unproductive. In the 75, west of Crosby's, the men are cutting down the south side level, where we hope to find a better part of the lode. The lode in the 70, east of San Francisco shaft is small and unproductive, and the ground very hard. The 65, east of same shaft, is also poor. The same level west is in a compact and regular lode, and opening moderately profitable ore ground, yielding 1 ton per fathom. In the 55,

[For remainder of Foreign Mines, see to-day's Supplement.]

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**WEST ESGAR LLE.**—The western mine continues to look well. The tributaries are raising a large quantity of ore, and a parcel will be ready for sale next week. The cross-out towards the south lode is progressing favourably,

REPORT FROM MONMOUTH AND SOUTH WALES

to entertain a very earnest wish that the lock-out will come to a speedy termination. Double turns are worked at their pits, and all the locked-out men that they can find room for in the workings are taken on, so as to make the very most they can to their present advantage. Apart from this, it is difficult to give a decided opinion as to what the state of things would be if all the pits were at work.

REPORT FROM LANCASHIRE AND CHESHIRE.

The joint-stock mania at Oldham increases, and there seems in many towns of Lancashire a saying that the working classes are being infected by the desire to make money out of shares. At one town, I am informed, a sort of open stock exchange is held weekly, and the transactions, which are mainly in purely local concerns, are carried on amid much excitement.

The labour market is generally in a very settled state.  
[For remainder of Business Correspondence, see page 199.]

COPPER ORES.

Sampled Feb. 3, and sold at the Royal Hotel, Truro, Feb. 18.

Mines.	Tons.	Price.	Mines.	Tons.	Price.
South Caradon .....	79	£5 17 6	East Caradon .....	35	£4 13 0
ditto .....	78	8 0 6	ditto .....	33	4 13 0
ditto .....	76	3 19 6	Bedford United .....	70	3 16 0
ditto .....	70	14 2 0	ditto .....	40	2 15 0
ditto .....	64	8 11 0	Wheal Russell .....	69	4 3 8
ditto .....	43	6 12 0	ditto .....	37	3 12 0
Marke Valley .....	82	3 1 6	Prince of Wales .....	84	4 19 8
ditto .....	75	3 6 8	ditto .....	43	4 9 8
ditto .....	78	4 4 8	Gawton .....	74	2 7 6
ditto .....	41	7 12 6	ditto .....	19	7 19 0
ditto .....	31	4 3 6	Phoenix .....	62	7 12 6
ditto .....	25	2 5 6	Wheal Friendship .....	19	8 5 6
Hington Down .....	102	2 6 0	ditto .....	19	3 17 6
ditto .....	85	2 4 0	Duchy Great Consols. ..	12	1 15 6
ditto .....	60	2 1 6	ditto .....	18	1 15 6
Glasgow Caradon .....	84	4 5 6	Trefry's Regulus .....	30	15 0 0
ditto .....	73	4 5 6	Calstock Consols. ....	12	2 4 0
ditto .....	54	4 14 6	Belstone .....	11	6 7 8
ditto .....	29	4 3 0	Skewes's Ore .....	4	6 5 6
East Caradon .....	72	5 1 0			

**TOTAL PRODUCE.**

South Caradon	431	2310	3	Gawton	86	271	8	
Marke Valley	381	1929	3	Whelan Friends	40	108	11	
Hingham	451	581	15	0	Wheat	40	250	11
Glasgow Caradon	240	117	12	0	Duchy Great Con	37	65	13
East Caradon	140	679	16	0	Trefry's Regulos	30	425	0
Bedford United	110	376	0	0	Calstock Consols	13	58	0
Wheat River	91	376	0	0	Wheat	4	25	0
Port of Wales	97	459	14	6	Skewes Ore	4	25	0
Average standard	2113	16	0	Average produce			63%	
Average price per ton						£4	19	0

Quantity of ore..... 1965 | Quantity of fine copper 133 tons 16 cwt.  
 Amount of money..... £2745 18 6  
**LAST SALE.**—Average standard..... £108 19 0 | Average produce..... 79½  
 Standard of corresponding sale last month, £113 16 0—Produce, 6¾.

Copper Ores for sale at Tabb's Hotel, Redruth, on Thursday week.—Mines and parcels.—West Tolgus 240—East Pool 120—West Seton 93—South Crofty 69—Cathedral 32—Wheat Seton 31—East Bassett 31—West Bassett 25—West Rosebar 15—New Dolcoath 6.—Total, 662 tons.



of better ground coming in. The other points remain much the same as for some time past. The engine and pitwork are in good working order, and the surface work going on satisfactorily.



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## AUSTRIA AND THE EAST.

The interesting and well-considered series of articles upon this subject by Dr. Peez has been reprinted in pamphlet form from the *Neuen Freien Presse*, and is well worthy of the thoughtful attention of Englishmen. Dr. Peez points out the important part which Austria has played in connection with affairs of the East, from which, indeed, she even derives her name. Old Ostmark was, in a military point of view, Europe's bulwark, established for the closing of the Danube, by way of which, from the days of Attila in the fifth century to the last siege of Vienna by the Turks in 1683, the desolating storms of the Turks and Tartars against Christianity came, and Dr. Peez contends that it is the destination of Austria, in consequence of her geographical position, to become the channel through which the commercial and business relations of Central and Northern Europe with the East must be carried on. If trade and commerce be not developed in the valley of the Danube to the same extent as on the more frequented Seine or Thames, and if at the mouths of the Danube no Holland or Belgium has been created, as at the mouths of the Rhine, the Maas, and the Scheldt, the reason can in no way be attributed to any inferiority of the Danube district in the gifts of Nature—for it is, on the contrary, noted for its great fertility—but the true cause of its backwardness to the natural slovenliness of the Asiatic people, for which rich meadowy steppes of Moldavia, Wallachia, and Hungary, as well as the southern slopes of the Balkan, has been a permanent boundary.

The prospect of Austria's participation in the Eastern trade, as Dr. Peez very truly observes, has become a question of establishing means of communication. The railways which have been determined upon for opening up the Indo-Oriental trade through Austria may be regarded as of two parts—the European and the Asiatic. The European lines, usually regarded as the Turkish lines, are those from the Bosnian frontier to Constantinople, and from the Serbian frontier to Salonichi, both of which are now nearly finished, and will doubtless prove of great advantage to Austria. With regard to the establishment of complete railway communication with India by way of Asia Minor and the valley of the Euphrates, he observes that without the aid of English capital the completion of the project is likely to be long deferred, but he thinks it can be shown to be to the advantage of England to support such an undertaking. The engineering difficulties in the way of establishing such a line of communication would be quite unimportant, but that they could prove of a remunerative character to the capitalists providing the funds, cannot be expected; indeed, it would be practically impossible for such a line to earn profits upon its outlay made upon it, and it is to this fact, and not to political motives, that Dr. Peez should attract the little attention which the various projects for a railway through Asia Minor and the Euphrates Valley has received from British capitalists. The comparison which has been made between such a line and the long lines in the United States is simply absurd, since in the Euphrates line the sole reason of construction would be to establish a through traffic for merchandise, which could be much more conveniently carried by other routes, whilst in the case of the United States lines they are made through regions already peopled, or being rapidly peopled, by a most energetic and enterprising people, and destined to commerce along their entire length.

The style of the pamphlet is most attractive, and gives so admirable an outline of the whole question, embodying many of the more important facts connected with the history of Austria, that it will be read with pleasure by many who care not whether the direct railway to India be established or left untouched, whilst to those interested in the construction of the line Dr. Peez has furnished all the information that can be required.

\* "Oesterreich und der Orient: eine handelspolitische Studie," von Dr. J. U. ALEXANDER PEEZ. Wien: F. Meyer, Tuchlauben.

## DOWSING AND DIVINATION—JACOB'S ROD.

It is, indeed, marvellous, almost as miraculous as the drawing of water from the rock of Horeb by mere smiting, recorded in the volume, the truth of which is not to be denied, to find persons in the nineteenth century, and apparently in full enjoyment of their reasoning faculties, who entertain the smallest particle of belief in the efficiency of the divining rod for facilitating the discovery of springs, mines, and minerals, yet there are probably no works recording the early myths which were accepted previously to the diffusion of scientific truths which are so interesting and amusing, especially to men engaged in connection with mines and minerals, as the hidden thing—mystic and alleged powers of the dowsing rod. The latest contribution to rhabdomantic literature is not less interesting than its predecessors, and the absence of the title of the work from which the translation is made will not lessen the number of readers who will take pleasure from the perusal of its pages. The translator is evidently a spiritualist of very decided views, and is, therefore, outside the pale of argument by the ordinary rule of logic, and has, therefore, a very decided advantage over many who will read his book, since he is enabled to exercise an amount of freedom in giving his record which many could not aspire to.

The work in question premises that "The most healthy philosophy allows that the stars influence all subliminal things, and that the quality which is proper and individual to each body, animate or inanimate, depends absolutely, or derives its nature from that which the star impresses on it which rules over it, even from its generation;" and it should be impressed upon every reader of works of the nature of Jacob's Rod that unless he admits the truth of this premise he must acknowledge that the assertions of those who accept it as the basis of their philosophy must, to use the mildest language, be received with the greatest doubt. Trusting, then, that the volume will not fall into the hands of any suffering from the lameness disease of psychomania, it may be observed that the author's "only object is to treat of those to whom God, by the influence of the stars, has impressed the faculty of discovering by the movement of the rod, called Jacob's rod, all hidden things, subterranean, and others." The author of the treatise now under consideration has decidedly more judgment than many who have succeeded him, since he teaches that the faculty is not in the wood, nor to the instrument one uses, but rather to the efficiency of blood of him who uses it. It is the blood which causes the wood to turn by the impression it communicates to it at the moment the man takes it with his two hands, so that this instrument, whatever its quality, is only a signal of which the man makes use to indicate to him the movement of his blood upon what there is hidden. A mark of this truth is that the dry wood of whatever nature it may be turns as easily as the green, and not only the wood, but also iron, silver, brass, wire, wialbone, and all other supple and solid matters, excepting in the cases which we will name afterwards. The exceptions appear to be that "The rod must not be of the same nature as the hidden thing—that is to say, of gold, silver or brass, wire, or wialbone—to seek for things of this nature, as it is evident that it would not turn for the same kinds of which it is composed."

The directions given for searching for minerals differ somewhat from those ordinarily given. As the rod was alleged to turn both to water and to minerals the removal of an objection became necessary; but upon this point the author was not at a loss. He remarks that "Those who search for metals would not wish to find water; on the contrary, as it might deceive them in causing the rod to turn the same as the metal, which may be above or under, and may cause them excessive expense to exhaust it from the mine when it is found with it, they would prefer that there should not be any at all. To extricate one from this embarrassment one tries before everything to ascertain if there is any spring in the place where the rod turns, and in order to discover it at the time of the search one has the precaution of putting a wet rag at the end of the rod, and when one sees that this linen does not stop this movement one knows at once either that there is no water, or that if there is it is joined with some other matter that continues this movement." As this matter can only be a metal, a mineral, &c., after having touched it with several metals, or minerals, &c., without their stopping, one draws again this conclusion, that there are no metals, or minerals, &c., in these places, or that with them there are also other kinds which continue this movement, such as a dead body, a boundary, &c.; for a dead body one must touch it with some rotten or putrid animal matter. . . . It is also held as a rule that the kinds do not oppose each other, and that when, for example, instead of three kinds that are hidden one would touch the rod with six either at the end in the hand, it is certain that the three superfluous ones will not prevent its movement, as the defect of one of the three could continue it. All that this abundance can produce is confusion and embarrassment to know which of the six are not there; to extricate oneself one must try as often separately and conjointly that one may find at last the only three which stop it, and at the same time one knows the superfluous ones." It is explained that if the kinds of which one makes use to stop are not entirely of the same quality as the hidden ones, so that good metal will not stop for common iron or copper, &c., again, the admixture of sulphur or antimony with the metals to be discovered interferes with the action, so that remedial measures have to be taken. It is further stated that "the rod turns also for coal and for all other minerals, such as mercury, sulphur, antimony, ochre, and their composites in which they dominate, as gypsum, red chalk (not the black, in which there is no cinnabar), and also others, so that if the metals do not suffice to stop the movement one must again try these minerals and their composites in any way one can, until one has found the one which was wanted to stop it."

The three succeeding chapters profess to explain by what means one may know the width of the hidden springs and mines, the depth of sources or metals, and the size of sources or of mines, and contain nothing more than usually absurd; but the tenth chapter is really astounding, since it professes to teach the method of using the divining rod for discovering boundaries, roads, or paths. Referring to boundaries, it is stated that "the first rule that must be observed for the discovery of limits is that of holding the rod couched (lying), or half couched, it turns at the moment that we are over the limit, and over the two limits which serve as a separation; from one limit to the other, when even there shall be no trace to mark it. But it must be observed that the movement which takes place over the limit, or over the width of the separation, is different from that given over the length. Over the limit or over the width it turns always in lowering, and over the length always in going up towards the stomach, as if one were following a spring or the vein of a mine. The second is, that the rod turns as well over the visible as over the hidden limit, not only over the place where it is, but also in that where it ought to be in the event of it having been transplanted, as well as in all the space that it ought to occupy in length, which indicates and serves to recognise the true place of the separation when the limit has been changed without the common consent of the proprietors. The third is, that as metal stops the movement for metal, wet rag for water, &c., so also part of a limit, whether that of the one we seek or of another, provided it is that of a real limit, or a little of the earth (land) which may be in the space of the limit, stops the movements for limits if you touch them with the rod." In explaining the different causes of the rod's movement, it is admitted that even then (1693) there were many who attributed the movement of the rod to imposture, and that it rested "less in a natural action than in a suppleteness or dexterity of hands;" but the author maintains that "loadstone has always attracted iron, fire has always tended upwards, earth has always fallen downwards, and the rod has always turned when it has been carried over

"Jacob's Rod: a Translation from the French of a Rare and Curious Work, A.D. 1693, on the Art of Finding Springs, Mines, and Minerals by Means of the Hazel Rod." By THOMAS WELTON. London: The Translator.

matter proper to cause its movement." He thinks that all the movements can be explained, and referred to physical causes, but his ideas of what physical causes are certainly do not agree with those of acknowledged authorities of the present age.

By the publication of the volume Mr. Welton has entitled himself to the thanks of every right-thinking individual, and he has shown that whatever may be the shortcomings of spiritualists' stupidity is certainly not one of them. He affords abundant evidence that all who have maintained the efficacy of the dowsing rod have done so for their own individual benefit, and that although their writings display the most profound ignorance of the simplest elements of scientific truth, they have succeeded, and probably will continue to succeed, in duping a sufficient number of weak-minded persons to make their avocation highly profitable. In many of the books published upon the subject there has been an effort to combine truth with fiction which has rendered the perusal of them dangerous to a certain class of readers, but Mr. Welton's work has no such defect; he gives the statements as originally made by their authors, and wisely avoids all efforts to give an air of truthfulness to statements which are obviously untrue. He explains the process of psychologising with precision, and thus enables even the most thoughtless to comprehend how the trick is performed, not the least amusing direction being that the operator is to avoid choosing those who have their eyes wide open, but to select those whose visual organs have a tendency to close. It is, probably, the most complete account of the dowsing rod that has been published, and the addenda, which Mr. Welton has collected from various sources, prove beyond question that the ignorance which prevailed in 1693 has not been dispelled, notwithstanding our boast of the progress of science, even in 1875. The volume deserves a place in the library of every rhabdomancer, whilst those who neither believe in dowsing and divination nor fear the effects of psychologism will derive a couple of hours' real amusement from the study of it.

\* With this week's Journal a SUPPLEMENTAL SHEET is given, which contains:—Original Correspondence: Gold and Silver Mines of Gilpin County, Colorado (C. S. Richardson); Mining Claims in America (H. Syme); American Slate Trade (R. L. Williams); Mining in Australia (J. Hunt); Mining in New South Wales: Javalil Mine; Rock Drills (G. W. Denys); Legitimate Mining, and What is Implied Therein (R. Knapp); Providence Mines (E. Frythall); Mine Accounts: Successful and Unsuccessful Mining (T. H. Allen); Wetherington Mine, Traccon-Engine, and Railways (J. Yelland, W. Boustred); Cies Hill Colliery (W. H. Harrison); Bedgellet; and its Slate Quarries—Foreign Mining and Metallurgy—Australian Mines Reports—Foreign Mines Reports—Patent Matters—Meetings of the Grenver and Wheel Abraham, St. Agnes Consols, The Lovell, Mid-Mounts, Merrybent Mining and Railway, Fitzroy Bessemer, Littleland Woodside Coal, West Wheel Seton, East Nant-y-Mwyn, and English and Australian Companies.

## The Mining Market: Prices of Metals, Ores, &amp;c.

METAL MARKET—LONDON, FEB. 19, 1875.

COPPER.				IRON.			
Best selected . . . ton	92 0	0	94 0	Bars Welsh, in London	8 17	6	—
Tough cake and tile . . .	90 0	0	92 0	Do., to arrive . . . . .	8 15	0	0
Sheathing & sheets . . .	96 0	0	—	Nail rods . . . . .	9 10	0	—
Boils . . . . .	99 0	0	100 0	Do., in London . . . . .	10 10	0	—
Bottoms . . . . .	99 0	0	100 0	Do., ditto . . . . .	11 10	0	—
Old . . . . .	99 0	0	100 0	Hoops, ditto . . . . .	11 10	0	—
Australian, Wallaroo . . .	92 0	0	93 0	Bars, at works . . . . .	9 10	0	—
Do., ditto other brands . . .	88 0	0	90 0	Hoops, ditto . . . . .	10 10	0	—
Chill bars, g.o.b. . . . .	83 0	0	84 0	Sheets, single & plate . . .	10 12	15	0
Wire . . . . .	83 0	0	—	Pig No. 1, in Wales . . .	5 0	0	10
Tubes . . . . .	0 1	0	—	Refined metal, ditto . . .	7 0	0	8
BRASS.				Bars, common, ditto . . .	7 15	0	8
Sheets . . . . .	9 1/2	d.	10 1/2	Do., merchant, f.o.b. . .	8 0	0	8
Wire . . . . .	9 1/2	d.	—	In Tyne or Tees . . . .	8 0	0	8
Tubes . . . . .	12 1/2	d.	13 1/2	Do., railway, in Wales . .	6 15	0	7
Yellow metal sheathing . .	8 1/2	d.	8 3/4	Do., Swed. in London . .	10 17	5	0
Sheets . . . . .	8 1/2	d.	8 3/4	To arrive . . . . .	17 5	0	—
SPELTER.				Pig No. 1, in Clyde . . .	4 7	0	12
Foreign on the spot . . .	23 7	6	—	Do., f.o.b. Tyne or Tees . .	4 0	0	4
" to arrive . . . . .	23 10	0	—	Do., Nos. 3, 4, f.o.b., do. .	3 10	0	4
ZINC.				Railway chairs . . . . .	5 0	0	5
In sheets . . . . .	30 10	0	—	spikes . . . . .	12 10	0	14
TIN.				Indian Charcoal Pigs . .	8 0	0	10
English blocks . . . . .	95 0	0	—	In London, p. ton . . .	8 0	0	10
Do., bars (in bris.) . . .	95 0	0	—	STEEL.			
Do., refined . . . . .	95 0	0	—	Swed., in kegs (rolled) . .	—	—	—
Australia . . . . .	88 0	0	89 0	Ditto (hammered) . . .	19 0	0	20
Australian . . . . .	88 0	0	—	Ditto, in faggots . . . .	20 10	0	—
TIN-PLATES.				English, spring . . . . .	19 0	0	24
Charcoal, Ist quality . . .	1 15	0	—	LEAD.			
IX Do., 2d quality . . .	1 16	0	17 0	English Pig, com. . . . .	22 10	0	23
IX Do., 3d quality . . .	1 2	0	3 0	Ditto, L.B. . . . .	22 15	0	23
IX Coke . . . . .	1 2	0	3 0	Ditto, W.B. . . . .	23 10	0	—
IX Ditto . . . . .	1 13	0	14 0	Ditto, sheet . . . . .	24 5	0	—
Canada plates, p. ton . .	18 10	0	19 0	Ditto, red lead . . . . .	5 0	0	—
Ditto, at works . . . . .	18 0	0	18 10	Ditto, white . . . . .	30 0	0	32

At the works, 1s. to 1s. 6d. per ton less. f Add 6s. for each X.

REMARKS.—There has been no change of any importance to record with reference to the position of the Metal Market during the past week. With one or two exceptions, prices have been firmly maintained, and the amount of business transacted has sufficed to support the market. The fact that, notwithstanding the almost total absence of speculation, and the causes which are in operation to hinder the development of trade, prices continue to be as firm as they are proves incontestably the inherent soundness of the metal trade; and there can be but a reasonable expectation that as the spring advances, and the busy time of the year draws on, not only will there be a marked increase in the legitimate trade of the country, but, together with this, there is pretty sure to arise a speculative movement, which will cause a sudden advance in quotations to a point, perhaps, beyond that which they are entitled to attain through the simple operation of the laws which regulate supply and demand. Already projects are on the tapis which may impart a very important impulse to the metal trade, and more particularly to that branch of it which is suffering from lack of animation. Bank rate was advanced on Thursday to 3 1/2 per cent.

COPPER.—At the commencement of the week copper was firm, and the tendency appeared to be upward; but as the week progressed the market became easier, business more restricted, and slightly lower prices have been accepted. At the moment the condition of the market is best described as sluggish, but in view of the comparatively small stocks of raw copper in first hands, and the belief that smelters are but poorly provided with furnace stuff, it may be expected that upon any increased demand for manufactured metal, will exhibit renewed activity, and price advance. At present, there is no reason to believe that any further material decline will occur, unless unexpectedly large supplies should come forward from the West Coast. The enquiry for manufactured copper for shipment continues, and the chief assignable reason for the existing quietude appears to be the slightly increased stringency in the money market. On Monday the sale of nearly 300 tons of Chili bars was reported, named brands, at 84s. and g.o.b. 82s. 10s. cash. Regulus to arrive has realised 16s. 9d., Wallaroo, 93s., and Burma 90s. On Thursday Chili bars, g.o.b., changed hands at 82s. 12s. 6d. net cash, and 83s. usual terms, also at 83s. 10s. To day the market is quiet, without any alteration. Tough is quoted at 90s.; best select, 91s.; and 4 by 4 India sheets, 92s. Yellow metal, 8 1/2 d.

IRON.—The tendency of the pig-iron market in the North of England is to continue firm. It is not probable that there will be any important alterations in quotations so long as the uncertainty regarding the future course of events as between masters and men remains as at present. The commitments of buyers do not extend beyond the requirements of the moment. It is impossible to foresee the future, and it would argue very great want of ordinary caution to incur needless responsibility. Makers make for consumption, and as fast as their iron is made it is shipped off to foreign markets, or it goes into home activity. The difficulty with the blast-furnace men can hardly be said to have been got over, although the reduction has been in some sort accepted. The quotations for pig-iron are as follows:—No. 1, 62s. 9d.; No. 3, 58s. to 58s. 6d. The quotations for finished iron remain much the same, but in consequence of the position of affairs in South Wales enquiries are more numerous in this district than they have been. The rail market is still very dull, although the enquiry for this description of metals has somewhat improved, but no orders of any importance have been booked during the week. The closing quotation for warrants to day is 73s. 6d.

SHIPMENTS.  
Week ending Feb. 13, 1875. . . . . Tons 7,792  
Week ending Feb. 14, 1874. . . . . 7,138  
Increase . . . . . 654  
Total increase for 1875 . . . . . Tons 10,917  
LEAD.—This market has been very quiet throughout the week,

and quotations have been barely sustained. There is no question but that sellers would be prepared to meet buyers' requirements in the matter of price to some extent, with a view of booking a good order. English soft pig is quoted 22s. 10s. to 22s. 15s.; and soft Spanish, 22s. to 22s. 5s.

SPELTER.—There has been a considerable demand for English hard spelter, and the sale of 120 tons is reported at 17s. 15s. There are no transactions in Silesian spelter published during the past week.

QUICKSILVER.—Spanish affairs appear to exercise an important influence upon the position of this metal, which ever since the establishment of the new regime has gradually fallen in value. The probabilities of supplies being interrupted by the Carlists or other disturbing causes being not so great, it is likely that this metal may ere long revert to quotations more nearly assimilating to those of former years.

TIN.—This market has been without animation throughout the week. Very little tin has changed hands, and prices are tending downwards. Straits is quoted 89s. to 90s., and Australian of good merchantable quality 88s.

TIN-PLATES.—The market is firm, and some makers are fairly supplied with orders.

THE IRON TRADE.—(Griffiths's Weekly Report).—Friday Evening, The Glasgow market for g.m.b. iron has been steady during the week. This morning the market opened with business at 73s. 10 1/2 d., warrants being scarce; this afternoon the closing price was, sellers 73s. 9d., buyers 73s. 6d. The closing price last Friday was 73s. 3d. This afternoon's price, therefore, gives a gain on the week of 6d. per ton. The quotations on the London Exchange this afternoon were practically the same as Glasgow prices. We quote makers' No. 1 iron as follows:—Guthrie, 87s. 6d.; Coltness, 90s.; Calder, 90s.; Langloan, 90s.; Summerlee, 87s. 6d.; Monkland, 75s. f.o.b. Glasgow; Glenarnock, 85s.; Eglington, 75s. f.o.b. Androssan; Shots, 87s. 6d. f.o.b. Leith; Kennel, 82s. 6d. f.o.b. Boynes. Our market continues steady for all the best qualities of iron. The demand for Staffordshire and Yorkshire keeps up tolerably well. There has been a fair business this week in sheet iron, hoops, and nail rods, and the demand for small round and square for export is unabated. The stocks at the stores of the various railway and engine factories were reduced to the lowest ebb in December last. From the beginning of the year constant moderately large orders have been given out by the different railway companies to the Staffordshire and Yorkshire houses for bars. These requirements have influenced orders this week to a larger extent than usual, as there appears now to be a better prospect of a settled market for the year. The deliveries of iron into the Thames this week have been above the usual average, it being absolutely necessary now for the Thames-street houses to augment their attenuated stocks. We have more than once called attention to the circumstance of the monopoly of this market enjoyed by Belgium in a particular class of iron—we mean Channel and girder iron. We mentioned last week that a contract for 800 tons had been taken by Belgian houses, to be consumed for building purposes in Manchester. Comparatively the whole of this kind of iron used in the new public buildings of London is supplied by Belgium, and the quantity thus absorbed is marvellous. A large building in Cannon-street, only 20 yards from our own office, is being constructed entirely with Belgian girders and other iron appliances; this circumstance is the more regrettable because numbers of our ironmasters in Staffordshire have all the facilities and requisites to make it, but we are undersold at present by the Belgian makers to the extent of 2s. per ton on large girders, and other iron used in building. Pig-iron on the Birmingham Exchange, yesterday was firm at late prices. Pig-iron on the Middlesbrough Exchange is a shade firmer, coke a trifle dearer. The Glasgow market has been steady all the week, the price generally being somewhat above 73s. There is no change in prices at Barrow-in-Furness. The tin-plate trade is tolerably steady. The demand for galvanised sheet-iron continues unabated.

COPPER.—Messrs. Harrington, Horan, and Co. (Liverpool).—On the 5th inst. cablegrams from Valparaiso announced charters for the second half of January as 1100 tons bars and 200 tons ore for England and 400 tons bars for France. Notwithstanding the look-out in the South Wales coal trade, the copper market continues wonderfully steady, and during the past fortnight prices of Chili bars have only fluctuated 20s. per ton. English copper is decidedly firmer, and in steady demand. Business transacted during the past fortnight comprises about 1280 tons Chili bars on the spot at 82s. 10s. to 84s. 10s. per ton, and to arrive with extra prompt about 415 tons bars at 83s. 10s. to 84s. per ton, 780 tons regulus to arrive here sold at 16s. 9d., and to arrive at Swansea 92s. tons ore at 16s., and 318 tons regulus at 16s. 6d. per unit. Arrivals here during the fortnight of West Coast, S.A., produce:—Birdstone, from Valparaiso, 100 tons bars; Potosi, 21 tons ores, 605 tons bars, 33 tons Barilla. Stocks of copper (Chili and Bolivian) in first and second hands, likely to be available, we estimate at—

	Ores.	Regulus.	Bars.	Ingot.	Barilla.
Liverpool . . . . .	21	—	9,857	403	33
Swansea . . . . .	605	1767	988	—	—
Total . . . . .	626	1767	10,845	403	33

Representing about 12,247 tons fine copper, against 12,242 tons Jan. 30; 21,903 tons Feb. 15, 1874; 24,900 tons Feb. 15, 1873; 12,800 tons Feb. 15, 1872.

Quantity of Chili produce afloat and chartered for to date—10,067 tons fine.

Stock of Chili copper in Havre, 2060 tons fine.

Messrs. Vivian, Younger, and Bond—COPPER: The demand for foreign sorts only moderate, and the general tone dull, without much change in prices. English manufactured in steady request, and now that second-hand parcels are for the most part cleared off prices are more regular. Makers are fairly busy with sheet orders. Yellow metal only in moderate request.—TIN: Prices dropping under heavy supplies of foreign.—TIN-PLATES: Demand slackening; makers for the present are occupied chiefly with old orders.

Messrs. James and Shakspeare.—COPPER: In furnace material the smelters have purchased by private contract about 750 tons Chili ore at 16s., and 560 tons regulus at 16s. 6d. and 16s. 9d. per unit, all to arrive at Swansea. Bars show little or no change from the values we gave in our circular this day last week. A fair but moderate trade has been doing since that date, both in good ordinary and picked brands—the former at 83s. 10s. cash and forward delivery, the latter at 84s. to 84s. 10s. same terms. Australian sorts participate in the general quietude, but an enquiry seems to be springing up from Russia in anticipation of the spring requirements of the country. English continues very firm, and smelters are fairly supplied with orders.—TIN: English is quite neglected, and quotations are almost nominal. In foreign descriptions great irregularity prevails, both Straits and Australian having been reported sold at a reduction of 2s. from the values obtained at the close of last week. The bulk of the metal, however, now offering in this market is in the hands of importers or dealers, who demand the top prices on our list, and as yet refuse to make any concession thereon. The shipment of 800 tons to this country for the first half of this month were only 70 tons.

Messrs. Henry Rogers, Sons, and Co.—The past has been a very inactive week to the metal trade, the demand for most descriptions being exceedingly limited; but prices rule about the same as last week.—COPPER: Operations appear to be suspended for the moment, in the absence of the usual fortnightly cablegram from the West Coast. There has been some slight demand for English, and second-hand parcels seem to be cleared off the market, but the home trade is only moderately active. Some small parcels of regulus have found buyers at 16s. 9d., and special brands of bars at 84s. 10s.—TIN: This metal has a decidedly downward tendency, English especially showing much weakness.—SPELTER is quoted lower, but the quantity of foreign offering is at present very limited, and price therefore, are somewhat irregular.—LEAD: There is a slightly better enquiry, and prices appear to have reached a saleable point.

Messrs. Pixley and Abell.—GOLD: The demand for gold for the Continent continues to a moderate extent; the arrivals of the week have been sent away, and withdrawals from the bank, to the amount of 223,000l., have taken place. The existing orders are likely to absorb all immediate arrivals, and it is probable that further recourse will have to be made to the Bank, as the shipments from America are likely to stop, and of the amount due on the 22nd inst. from Australia (403,400l.) 205,000l. consists of sovereigns; the remainder, 198,400l., will be taken for export. We have received 10,900l. from the West Indies, 60,000l. from New York, 60,000l. from the Brazil, 3,800l. from the Cape, and 20,000l. per French steamer from Japan. The Mosel has taken 34,000l. to New York, and 100,000l. in sovereigns have also been taken from the Bank this day for transmission to the same place.—SILVER: The arrivals during the week comprise 34,840l. from the West Indies, and 80,000l. from New York. These amounts have been sold at 87 1/2 d. per oz., which may be considered as the present quotation. The Taga, 5800l. to the West Indies, and the Decan 194,800l. to Bombay, including 164,500l. on account of the Government of Mexico. DOLLARS: The French steamer brought about 26,000l. to St. Nazaire on English account, and 14,000l. for France; these have been sold at 56 1/2 d. per oz.

THE MINING SHARE MARKET has been dull this week, and without any particular feature to notice, except a great and general fall in the quotations for tin mines. The principal transactions have again been in lead mines, embracing Tankerville, West Tankerville, Roman Gravel, South Roman Gravel, Van Consols, Pennerley, and others. In copper mines there have been enquiries for Parys Mountain and Marke Valley. In tin mines scarcely any business doing. At the Cornish Ticketing, on Thursday, 1966 tons of copper ore were sold at 97 1/2 d. 8s., or an average of 4 1/2 s. per ton. The average standard 113s. 16s.; produce 6 1/2 s. being an advance of 1 1/2 s. Carn Brea have declined to 40s. 4s., a fall in a few weeks of nearly 20s. per share. Cook's Kitchen have declined to 8s. 3d.; Dolcoath to 45s. 4d.; Tincroft to 24s. 2d.; East Lovell, 6s. to 7s.; Wheal Kitty (St. Agnes), 4 1/2 s. to 5s.

Old Treburget, 8s. to 10s.; the accounts issued preparatory to the general meeting, and dating from Jan. 17 to Dec. 31, show sales of silver-lead ores, 15,135s. 5s. 10d.; the expenditure for costs, 9754s. 14s. 5d.; materials, 2347s. 12s.; carriage of ore, 198s. 3s. 11d.; royalties, 1488s. 8s. 8d.; London expenses, 551s. 8s. 1d.; dividends paid to the shareholders, 1644s. 3s.; balance in hand, 351s. 17s. 7d. During the year, the report states, upwards of 1000l. included in the costs, has been expended in alterations and additions to machinery, and in permanent works that will reduce the costs in future. In regard to the mine, the returns have lately fallen off, but in a special and most exhaustive report which has also been published,







### Notices to Correspondents.

\* Much inconvenience having arisen in consequence of several of the Numbers during the past year being out of print, we recommend that the Journal should be filed on receipt; it then forms an accumulating useful work of reference.

**NEW PATENT LAW—"R." (Barnsley).**—The Lord Chancellor's Bill is, no doubt, short of absolute perfection, but the principle of the Bill is generally acknowledged to be excellent. There is probably not one case in a thousand in which a poor inventor pays even the £5 Government fee for the provisional protection (the money being usually furnished by a friend in better pecuniary circumstances), and the poor inventor, with only provisional protection, and unprepared to pay the remain fees, for stamps and agency, falling due between the application and the filing of the specification, is almost as much at the mercy of the capitalist as he would be with no protection whatever. Under the proposed Act the inventor will, as soon as the law officer's report has been given, have a property possessing a real money value, and, therefore, saleable. It is, no doubt, much to be desired that the stamp on application should be reduced from £5, to £5., which would, of course, enable every inventor to protect his invention without the aid of friends, and put him in the best possible position to sell it or secure its use.

**THE LONDON AND CALIFORNIA MINING COMPANY.**—Being largely interested in this company, it is with pleasure that I congratulate my fellow-shareholders on the great improvement in the prospects of our mines. For if the new lode in the Amador Mine continues as rich as is anticipated I see no reason why we should not ere long be receiving large dividends from our property. And I confidently hope, within a very little time, to see the shares take a leading position in the market.—S. C. C.

**HOW TO KNOW THE USEFUL ORES—"K. H." (Turro).**—There is no book giving the information you require with regard to prospecting in Australia, but it matters nothing, since copper ore of a given character is equally valuable wherever found, and can be recognised with equal facility. The little American work, "Underground Treasures, and Where to Find Them," by Prof. Jas. Orton, A.M., published by Dustin and Worthington, of Hartford, Connecticut, would no doubt give you as much information as you require. You could carry all necessary apparatus in your coat pocket. The price is about \$1.

**CANADIAN PLUMBAGO—"R. A." (Hampstead).**—Not much, if anything, has been done towards introducing the Canadian plumbago into this country, but it was stated that the Patent Plumbago Crucible Company, of Battersea, had taken a large parcel for sample. The quality is excellent, and if your suggestion to establish a pencil factory and crucible works on the spot could be carried out it would, no doubt, be advantageous to the Dominion, and remunerative to those engaged, as you state.

**The fastest railroad time on record** is said to have been made not long since on the New York Central Railroad, by a special train, which carried a party of officials from Rochester to Syracuse, 81 miles, in 61 minutes.

**IRON INDUSTRIES OF LANCASTHIRE, BY RICHARD MEADE, ASSISTANT KEEPER OF MINING RECORDS.**—In this article, in last week's Journal, under the head of "Metal Extraction Works in Lancashire," in 1873, the "purple ore" (oxide of iron)—270,000 tons—should be read as yielded from all the works in Great Britain, and not from the seven works in Lancashire; the "burnt ore" from which it was obtained amounted to, as there stated, 323,910 tons.

**"LEAD ORE."**—Your communication not being authenticated with name and address, and being, moreover, a mere expression of opinion unsupported by evidence, cannot appear. As the value and prospects of the mine are not even discussed, it would seem that your letter has not been written from disinterested motives, or with the absence of personal animosity.

**THE SUPPLEMENTARY SHEET.**—We have received occasional complaints, and of late a good many, that the Journal is delivered by country booksellers without the Supplement. Subscribers would oblige us by demanding that the paper should be handed to them complete, as every Journal is accompanied by the Supplement when it leaves our office, and the fault of omission must rest with the country bookseller or their London agent.

**SHARE DEALING.**—We never interfere in the sale or purchase of shares; neither do we recommend any particular mine for investment or speculation, or brok through whom business should be transacted. The addresses of most of the latter appear in our advertising columns.

**Revised.**—"M. D." (Saltash)—"J. D. E." (Eureka)—"J. B. B."—"Constant Reader" (London and Pacific Coast Mining Bureau)—"C. S. R." (Colorado)—"Jethro Jethrington" (Eureka)—"D. E. M." (New York)—"Tamar"—"Shareholder" (Van Consoles)—"E. P."—"R. B."—"Constant Reader" (Leeds)—"Lombard" (Newfoundland Lead)—"An Old Shareholder" (Javali).

## THE MINING JOURNAL,

### Railway and Commercial Gazette.

LONDON, FEBRUARY 20, 1875.

#### AMENDMENT OF THE PATENT LAWS.

The new Bill for the amendment of the law relating to the grant of Patents for Invention, brought into the House of Lords by the Lord Chancellor, is one which appears in every respect to meet the requirements of the case, since it secures the fullest justice to inventors, and will do much to prevent the existence of patents which are neither new nor useful. The agitation which has been made for the abolition of patents in this country has thus not only failed, but has probably contributed to bring about a modification of the law as will be gratifying to all classes. The Bill displays a due appreciation of the claims of inventors, but at the same time very properly rejects the idea that an invention is a tangible property, similar in any respect to property in houses and lands. In the case of a house or an acre of land full possession of either cannot be held by two persons at the same time, but in the case of an invention it is altogether otherwise; indeed, it may be affirmed that as a matter of fact, if a defect in a given machine, or in a given process, be pointed out to 20 competent workmen, 19 out of the 20 would suggest an effective remedy, and the remedy suggested by 10 out of the 19 would be the same. Now, inasmuch as there would here be 10 persons equally entitled to one and the same property, it is obviously absurd to argue that either of the 10 inventors have an inherent right thereto, since each one, assuming the remedy to be the creation of his own brain, would be equally entitled to claim it as his own property, regardless of the fact of another having previous claim to a similar creation. If actual and independent creation be admitted to give a right in one case it must be admitted to give an equal right in another. Hence it follows that, although copyright can exist in consequence of the improbability of two authors or artists expressing the same ideas, and using the same language or figures to express them, the existence of patent right cannot be acknowledged, owing to the existence of the facts already mentioned.

But it by no means follows that because an inventor can possess no patent right that, therefore, he possesses no claim for compensation should he be the first to give the public the benefit of a new invention which has emanated from his brain. Far from it, and the grant of patents for invention, as a privilege but not as a right, has been recognised as the easiest and most equitable method of recompensing inventors, so that what the Lord Chancellor had to do, and has done so ably, was to suggest the means of fully recompensing inventors with the least possible inconvenience to the public. The leading feature in the new Bill is that the principle of examining inventions, which has long been urged by the "Inventors' Institute" as desirable, and which has long been in force in the United States, has been adopted, and assuming such examination to be desirable, although that is exceedingly questionable, the Lord Chancellor's method of ensuring its efficiency leaves nothing to be desired. There are to be, according to section 6, from two to four examiners specially qualified for the office by legal or scientific knowledge; and, according to section 7, there are to be referees "specially qualified for the duty by knowledge of manufactures, arts, or science," and these referees are to be "distributed in panels according to their several qualifications." The obvious advantage of this will be that an invention involving a complicated chemical process will not be submitted to a cotton spinner, nor will the value of an invention for affixing soles to boots be submitted to the judgment of a chemist. The examiner and referees are to report to the Commissioners whether the invention is a proper subject for a patent within the Statute of Monopolies, whether the specification is sufficient, whether the invention is new as far as they can judge from an examination of former specifications, whether the invention is in the nature wholly or mainly of a combination of known machinery, substances, or processes, and whether the grant, if any, for it should be limited to seven years, or whether by reason of the frivolous character of the invention, or for any other reason, it is not worthy of a patent.

After the law officer's report to the Commissioners upon the opinion of the examiner and referees, the Commissioners are to make public the application and relative documents and report, and the applicant may then give notice of his intention to proceed with the application. If notice be not given within the prescribed time the

provisional specification thereupon ceases. If the law officer has reported against the application the applicant may, after notice to proceed, petition the Lord Chancellor for the grant and sealing of a patent. The 17th clause, again, is a very important one in the interest of inventors, since it provides that "a patent may be made to extend to any of Her Majesty's colonies and plantations abroad, except one in which it would be invalid by the law in force therein for the time being;" and a patent is to have effect as in the United Kingdom in every place to which it is so extended. And the 18th clause is not less important, for it authorises the extension of provisional protection to 12 months in the whole from the date of the application, and the extension of the time for sealing, so that the inventor with limited means at his disposal will not be made to suffer for his inability to make such rapid progress as the more fortunate inventor with abundant capital.

The improvement introduced with regard to foreign inventions will secure, as the United States law already does, the true inventor against the loss of his invention, for the Bill provides that in the case of foreign inventions no patent is to be granted unless the applicant declares himself to be the first and true inventor, and no patent is to be granted in respect of a communication from abroad; where a foreign patent is in force the foreign patentee can alone be the applicant. Notice of every foreign patent in existence at the date of the warrant is to be endorsed on the patent, and the patent ceases on the cesser of the foreign patent first expiring. Some such provision as this appears absolutely necessary for the protection of home manufacturers, since it would be unjust to leave the English manufacturer liable to pay royalty after the foreign manufacturer has been relieved. A patent is not to prevent an invention being used in a foreign vessel in British waters, provided British subjects enjoy reciprocity in the foreign State to which such vessel belongs.

Leave to amend a specification is granted in such terms as to ensure equal justice to the inventor and to those opposed to the patent, and the revocation clause could, no doubt, be effectively applied in many cases as a substitute for costly litigation. Assignments may be granted for England, Scotland, or Ireland separately, which will much increase the inventor's chances of getting his invention into use, and the existence of unworked obstructive patents is prevented by the provision that a patent may be revoked if the inventor or his licensees fail to put the invention in practice, or prove that he has made due efforts to do so. Where a patent is granted for seven years only it may be extended for not more than seven years longer, and the exposure of inventions at international, industrial, and other exhibitions, certified by the Board of Trade as likely to promote art or industry, does not invalidate the inventor's claim to a patent. The mode of procedure is simple, and appears likely to prove efficient, and provision is made for the employment of an expert practically acquainted with the matter in dispute to assist the judge.

The principle of the Bill appears to be incapable of improvement, and can scarcely fail to give equal satisfaction both to inventors and the public; whilst the only class—the patent agents—who appear opposed to it will probably find that it will not prove to their disadvantage. They will, perhaps, be unable to charge the comparatively high fees they have hitherto received, for whilst the Government fees payable during the first six months have amounted to 25s., the agent has usually received 25s. to 30s. for preparing documents and drawings; but as a compensation for this they will have a larger number of applications to make, and much less work than at present to perform. The connecting of the previously-granted foreign patents with the English will deprive the agents of some fees, but it will afford far greater security to the inventors, for it not unfrequently happens that from agents, who are neither chemists nor mechanics, undertaking to draw a new specification from the foreign descriptions forwarded to them, instead of merely making a correct translation and filing it, patents are at present obtained for inventions which have never had any existence except in the patent agent's fertile imagination, as the inventors, did they understand our language, would never recognise the descriptions as referring to the inventions which they had desired to protect; in addition to which, the descriptions are equally unintelligible to those connected with the same branch of industry in English-speaking countries. The system of preliminary examination, and the enabling of the examiners and referees to compare the applications, in the case of foreign inventions, with the original descriptions, will secure increased protection to inventors, and at the same time enhance the value of patent property generally. The progress of the Bill will be watched with great interest, and the result will be from time to time carefully placed before the readers of the Journal.

#### COAL IN THE UNITED STATES.

Pennsylvania, as all the world knows, is rich in coal resources, and measures appear to be in progress which are calculated to add very materially to the annual coal production of the State. The purchases of coal lands made during the past year by the Philadelphia and Reading Coal and Iron Company, added to those previously acquired, will make an aggregate of 100,000 acres. At present it is not intended to purchase any more coal lands except such few tracts of intervening lands as may be found to be necessary additions to the present estate. At the time when the Philadelphia and Reading Coal and Iron Company was first inaugurated it was not deemed necessary for the company to become owners of collieries and miners of coal, it being considered that an acquisition of coal lands to be worked by tenants was alone sufficient for the purpose. The company's experience for one or two years as landlords showed, however, how utterly inadequate, under existing circumstances, the individual tenants were to develop and improve the estate. But few private persons had sufficient capital to open and conduct a colliery in any other manner than to make it profitable during a few years. The depressed condition of the coal trade of Pennsylvania, in consequence of the repeated strikes of 1869, 1870, and 1871, had also given little encouragement to individuals to engage in coal mining, and those employers who had survived contests with their workmen had but little capital left with which to improve their collieries and open new mines for the future. It became, then, a matter of inevitable necessity for the company to follow the example of the large coal and railroad companies of the Wyoming district, and to become miners of coal upon their own estates. This policy has been steadily pursued for the last two years, during which a number of collieries, formerly worked by tenants, have been purchased. Works which have occupied the greater part of two years are now completed, and of 82 collieries now in operation upon the lands of the company 37 will be worked by the company itself, the others remaining in the hands of tenants until the expiration of their respective leases. Large retail yards in Philadelphia, and wharf and shipping facilities in New York and various eastern ports, have been provided.

Among the most important new works commenced by the Philadelphia and Reading Coal and Iron Company has been the sinking of two perpendicular shafts or pits in the vicinity of Pottsville, in order to reach and work the large white-ash coal veins of the Southern basin. This work has been prosecuted vigorously until a depth of 1128 ft. was reached by the deepest shaft, from which a bore-hole has been sunk into the Mammoth vein at a distance of 1954 ft. from the surface of the ground. The shaft will be continued down to Primrose vein—a depth of 1569 ft. from the surface—from which point the Seven-feet vein and the Mammoth vein will be reached by a tunnel. The several veins of workable coal opened by these shafts are as follow:—Tracey vein, 9 ft. thick; Diamond vein, 4 ft. thick; Orchard vein, 6 ft. thick; Primrose vein, 12 ft. thick; Seven-feet vein, 11½ ft. thick; and Mammoth vein, 25 ft. thick. These veins make a total coal thickness of 64 ft., exclusive of smaller veins, and in addition to these veins there are coal strata underlying the Mammoth vein which can be reached in the future, if required, by an extension of the shafts. The extent of coal territory tributary to these shafts is so great that there can be but little doubt that at least 100,000,000 tons in the several veins already opened can be worked through them. When it is considered that the deposits of coal thus opened out extend through the entire length of the Southern coal field—principally underlying lands bought at exceedingly low prices, and hitherto considered by many to be comparatively valueless—and

when it is remembered that the deposits are within 100 miles of Philadelphia, the importance of the "developments" made by the shafts can scarcely be over-estimated. Industry and capital combined can, under all the circumstances, scarcely fail to largely increase the coal production of Pennsylvania during the next decade.

#### INDUSTRIAL PARTNERSHIPS IN MINES.

We are by no means surprised that the system initiated by the Messrs. Briggs, of the Whitwood and Methley Collieries, of giving a portion of the profits to their workmen, has fallen to pieces. At the time it was introduced we stated that we did not believe that it would be found a panacea for all the complaints made by workmen, no more than it would entirely do away with strikes. It was, however, looked upon by many persons who take an active part in the means by which the miner was to be elevated in the social scale, and placed in a position leading to comparative independence. Lord Elcho and Mr. Hughes were in ecstasies over the scheme, and actually went down the mines in which the working collieries was to be a partner. Now, however, the directors state that they "regret they can no longer recommend the continuance of the System of Industrial Partnerships, so far as respecting the payment of a bonus on wages to the employees."

Thus, an experience of about nine years has shown that the bonus system, as adopted by Messrs. Briggs, has been a thorough failure. It was in July, 1865, that the private partnership of the firm was converted into a joint-stock company of limited liability, by which it was agreed that when the profits, after a fair reservation for redemption of capital, exceeded 10 per cent. one-half of the excess was to be given by way of bonus to the workmen. It appeared that not more than 10 per cent. of the workmen became shareholders, many believing that the bonus would have the result of keeping the men from obtaining advances of wages when trade was in a very prosperous state. Matters went on very well for a time, and the Union did not interfere with the works; when, however, the Messrs. Briggs, in September last, gave notice of a reduction of wages, a great change took place in the spirit of the men, who threw the bonus inducement to the winds, and became members of the West Yorkshire Miners' Association, stating in the clearest and most positive terms that they desired to be put upon exactly the same footing as to work and remuneration as the miners employed at the other collieries in the district. This, indeed, was the view held by a large number of the men, who from the first opposed the adoption of the industrial partnership scheme, which they looked upon as a movement for drawing the men away from the Union, and so isolating them that they would have no power to fall back upon in the case of a disruption between them and the Messrs. Briggs, who might be said to be the company, as they held at least two-thirds of the shares. So ends the great Industrial Partnership Scheme, that was ushered in with such an overpowering flourish of trumpets, and was so frequently alluded to in glowing terms by those who style themselves, or are styled, "the working men's friends," as the means by which strikes were to be ended, and masters and workmen to become one vast and interesting "happy family."

#### IFTON RHYN COLLIERIES, SHROPSHIRE.

The operations of sinking and boring which have been going on at these collieries for some time past are likely to be of such importance to the country generally, as well as to the company in particular, that a few particulars concerning them may prove interesting to the readers of the Journal.

The company was registered towards the close of February, 1873, and its first operations were directed to the widening and deepening of shafts which had already been sunk to the "top coals." These "top coals" lie above the great mass of red and grey marls and sandstones, locally known as the red ground, and which, covering the ordinary coal measures over a great part of the United Kingdom, as well as on the continent of Europe and in America, have hitherto been generally classed as Permian. Thin coals have been found near Manchester, in Nottinghamshire, in Germany, and in Nova Scotia, overlying this "red ground," but, as far as is known, they have not been worked anywhere except at Ifton and in the neighbourhood, where one of them attains an aggregate thickness of 4 ft. 3 in., and is a coal of good quality for household use. Extensive workings have been opened out in this seam at Ifton Rhy, the present output reaching nearly 300 tons per week, but the machinery and appliances have been erected with a view to an ultimate output of 300 tons per day.

The property leased by the company extends over an area of 9000 acres of coal land, which stretches from the River Dee, below Ruabon, to the Great Western Railway at Gobowen Junction. Along the western margin of the property are the collieries of Black Park, Brynkinalt, Quinta, and Preesgwyn. The workings of three of these collieries touch the boundary of the Ifton Rhy property, which, as will be inferred, lies to the deep and east of them.

In order to reach the deeper coal seams worked at those collieries a pit (No. 3) was started in November, 1873. In November, 1875, this pit was sunk 176 yards: 25 yards of this depth was sunk through the superficial gravel, sand, and clay. Through these the pit was sunk to a diameter of 20 ft. The permanent pit, of a diameter of 15 ft., was then built up from the solid red marl, and the space between puddled with clay. The effect of this has been to make the subsequent sinking perfectly dry. The pit was then sunk with its permanent diameter of 15 ft. to the depth stated above. A succession of red and grey marls and shales, with occasional rocks and streaks of coal, and a series of green rocks, similar to those found on the eastern outcrop of the coal basin in South Staffordshire were passed through. Pending the erection of a more powerful engine, it was decided to bore from the above depth, and the rods passed through grey and green rocks and red shales, with two thin coal seams of the respective thicknesses of 1 ft. and 6 in., until at a depth of 252 yards a coal seam ranging about 2 ft. 3 in. in thickness was reached. Below this three or four thin coals have been passed through, and it is also believed the thin limestone, known to geologists as the "Spirorbis limestone." If this be so, it fixes the present position of the boring above the Cefn freestone rock, under which lie the Ruabon coals. There is, however, over a large part of Shropshire, as well as in the Ruabon district, a "four-feet" coal seam between the Spirorbis limestone and the Cefn rock. Whether the present hand-boring machinery will be able to reach this seam is uncertain, but sufficient has been done to prove the continuation of the lower coal measures eastward under the Ifton property. It is intended to sink the No. 1 pit, to which powerful permanent engines have been attached, simultaneously with No. 3, to the lower seams.

These pits are placed near the eastern boundary of the property, where the coal lies deepest, and they will command unbroken stretches of coal to the rise of them. Associated with them, and with the No. 2 pit, through which the upper coals are worked, will be brick machinery and all the other colliery works. At the Gobowen or southern corner of the property two pits have been started, and the plant laid out for sinking to the lower coals, which will, in all probability, be reached at a much less depth than in the Ifton portion of the royalty. Various other collieries are projected in the eastern portion of the coal field, and the recent discoveries at Ifton must exercise a very favourable influence on these.

**COAL AND IRON IN THE UNITED STATES.**—The Back Mountain Coal Company has announced a dividend of 3 per cent. As compared with 1873, the coal movement of the Philadelphia and Reading Railroad fell off last year to the extent of about 3 per cent. The movement of last year amounted to 6,348,812 tons. Two pits have been sunk in the neighbourhood of Pottsville, Pennsylvania, in order to reach and work the large white ash coal veins of the southern basin. A bore-hole has been sunk into the Mammoth vein at a distance of 1954 ft. from the surface. The result of the operations undertaken is expected to be the rendering workable somewhere about 100,000,000 tons of coal. At Danville, Pennsylvania, all the blast-furnaces and



Ironworks are in full blast for the first time for eight months. Taking advantage of a great reduction in the price of steel rails the Boston and Albany Railroad Company laid in the year ending Sept. 30, 1874, about 13,000 tons in its main track. It is calculated that 10,000 tons more will give the company steel in both main tracks from Boston to Albany.

#### THE UNITED STATES TIN TRADE.

The subjoined statistics, showing the stocks and consumption of tin in the United States during the past seven years, with the highest, lowest, and average prices in each year, compiled by Messrs. WHITE and HASKELL, of New York, will be of general interest to the readers of the Mining Journal:—

	1874.	1873.	1872.	1871.	1870.	1869.	1868.
Imports	2400	3000	4363	4025	2880	2815	3410
Stocks on hand with im- porters and speculators, Jan. 1	1473	1000	750	990	804	500	390
Do. Dec. 31	640	400	125	141	237	195	218
Consumption	4612	4495	5238	5066	3999	3510	4018
Price of Straits	27 3/4	31	38	33 1/2	30 1/2	28 1/2	24 1/2
Lowest	21	27	29	32	30 1/2	27 1/2	22 1/2
Highest	28	33 1/2	42 1/2	38	34	34	28 1/2
Average	25 3/4	30 1/2	37	36	32 1/2	31 1/2	24 1/2

At New York (Feb. 5) the whole Metal Market is exceedingly quiet. The fluctuations in the price of gold, combined with the uncertainty of the question of duties, and the very small wants of consumers, have a very depressing influence on the market. Tin has declined to \$22 for Straits; \$21 1/2 L. and F.; \$21 1/2 English refined; and \$25 for Banca. Tin-plates, although quiet, remain firm. Copper is very quiet at or a little above a figure that will permit it to be exported—in fact, about 500,000 lbs. are said to have been purchased since Jan. 1 for that purpose. In lead, spelter, zinc, and antimony there is but little to say, prices being very weak, and but few transactions. Prices of iron, which have been advancing since Jan. 1, have come to a standstill, and if anything the market may be reported as inclined to weaken. There was a very good demand throughout January, but it appears to have entirely subsided. The business in Scotch pig is very small, and mostly at reduced prices. The receipts at this port for January were 1260 tons, as compared with 4190 tons during the corresponding month of last year.

**MINING IN INDIA.**—We are sorry to hear that the mines at Jubah, in the Punjab, India, have stopped work, at least for the present, and the Punjab Government, it appears, have stopped other mines, and appear desirous to prevent the working of any mines or other industry except those over which they can hold the most despotic control and a large portion of the profits. Not content with a monopoly of all the salt found "between the Indus and the Beas," they have taxed the salt in the Rajah of Mundi's estate, and have given notice they will tax it beyond the Beas, that is if they permit it to be worked at all. Long since they refused to permit any companies to start irrigation works, which they insisted on muddling themselves, and every attempt made to create a new industry or trade is at once trampled on, appropriated, or destroyed by the present despotic Government. Sir Douglas Forsyth has made bitter enemies of the entire Punjab Government by his endeavour to urge trade to the north of the Punjab, but as yet no European has succeeded even in tea planting, except two or three retired officers, military and civil, near Kangra, and General Sir Arthur Cunyngame's tea estate in Kulu.

**SUCCESSFUL COAL COMPANY.**—A. Knowles and Sons (Limited), coal proprietors, Lancashire, have issued their first annual report. With a subscribed capital of 1 1/2 million sterling. This is, perhaps, the largest coal company in England. The profits for the past year have been 136,590l., or 37 1/2 per cent. on the paid-up capital. After paying 12 1/2 per cent., the highest dividend authorised by the Articles till the reserve fund amounts to one-fourth of the paid-up capital, the sum of 91,248l. will be carried to the reserve fund.

**COAL ON RAILWAYS.**—In the half-year ending Dec. 31, 1874, the cost of the coal and coke consumed in the locomotive department of the North Staffordshire Railway was 16,213l., as compared with 20,840l. in the corresponding period of 1873. In the half-year ending Dec. 31, 1874, the cost of the coal and coke consumed in the locomotive department of the North-Eastern Railway was 186,482l., as compared with 250,717l. in the corresponding period of 1873. In the half-year ending Dec. 31, 1874, the cost of the coal and coke consumed in the locomotive department of the Midland Railway was 159,590l., as compared with 219,962l. in the corresponding period of 1873. Great relief has thus been obtained in the matter of coal by the railway interest; the savings realised under this head have, however, been neutralised to a great extent by the increased cost of labour.

**SALE OF COAL BY WEIGHT—ARTIFICIAL FUEL.**—The Weights and Measures Amendment Act, 1875, recently brought into the House of Commons, is intended to render the sale of coal, slack, culm, &c., otherwise than by weight absolutely illegal, the penalty for every such sale being fixed at not more than 5l.; the single working clause of which the Bill consists enacts that "From and after the day of — One thousand eight hundred and seventy-five, no coals, slack, culm, cannel, cinders, or coke of any description shall be sold by any person by way of retail other than by weight, such weight being marked legibly upon the cart, sack, bag, or any description of article containing the same, and in no less a quantity than one stone of fourteen pounds, and every person selling by way of retail other than by weight as aforesaid shall be liable, on conviction, to a penalty not exceeding five pounds for every such sale." It is a curious circumstance that the Act which this Bill is intended to amend has been habitually evaded, because the enactment that "every person who should from and after the said date sell any coal, slack, culm, or cannel of every description by measure, and not by weight, should, on conviction, be liable to a penalty not exceeding forty shillings" does not touch those who sell neither by measure nor by weight. The new measure will be particularly valuable in preventing the sale of artificial or compressed fuel to the poor unless the lumps or bricks be of the full weight of 14 lbs. each.

**MINING IN NORTH DEVON.**—Notwithstanding the great depression in West Country mining operations through the lock-out of the colliers of South Wales, there is no lack of earnest preparations for opening several red hematite iron and manganese sets in the neighbourhood of Barnstaple. Some Scotch speculators have secured a large tract of ore-bearing ground near the Ilfracombe Railway, and some of the specimens of manganese taken from the set have assayed more than 60 per cent. of metallic matter. Upon Exmoor several red hematite iron lodes have been opened, and it is believed there will be a large amount of work done there as soon as the trade looks more healthy.

**SUB-WALDEN EXPLORATION.**—Mr. Willett, the honorary secretary, reports that the old bore-hole has been abandoned, and the work recommenced at a spot a short distance from the old site, whither the machinery has been shifted. The exploration was renewed on the 11th inst., and a depth of 40 ft. was attained in the first five days. The honorary secretary says the new boring is over 6 in. in diameter, bringing up splendid solid cores of over 18 in. in length and 4 1/2 in. in diameter. An opinion having been expressed that in selecting a new site the committee should have gone more to the north-east, Mr. Willett gives the reasons which influenced them in deciding to recommence the work only a short distance from the first working. He says that besides the loss of time and expense of removal to a more distant spot, the contractors, knowing what they had to contend with, have undertaken positively to bore

and line 1000 ft. for 600l.—for 200l. more than the committee had consented to pay for enlarging and lining the old bore. It has been proved that the strata are as nearly as possible perfectly horizontal, thereby securing the maximum of depth at the minimum of penetration. This decision has also been followed by a large accession of support, including that of the Earl of Chichester, Lord-Lieutenant of the county. The honorary secretary had himself given another 50l. towards the work, and a like sum has been forwarded by Mr. C. Cochrane. The 100l. voted by the British Association has been received.

**GUNCOTTON.**—The Patent-Safety Guncotton Company (Limited) applied to the Stowmarket magistrates, on Monday, for a licence for their works for the manufacture of guncotton in a wet form. The application was supported by Mr. Poland, barrister, and was opposed by Mr. Salmon, solicitor, on behalf of certain persons having land adjoining the works. Mr. G. P. Bidder was called as a witness on behalf of the company, and expressed his opinion that the manufacture and carriage of wet guncotton was perfectly safe. Wet guncotton could not possibly be exploded accidentally, there must be a special appliance for the purpose. Even as regards dry guncotton, he thought that the Stowmarket explosion of 1871 would not have occurred if the cotton had not been feloniously dealt with. Mr. Eustace Prentice, the managing director of the company, stated that proportion of moisture in the cotton when it left the premises was 25 per cent. The magistrates eventually granted the licence, subject to such conditions as should be approved or required by the Secretary of State for the Home Department.

#### REPORT FROM CORNWALL.

Feb. 18.—The falls in the tin standard have unmistakably caused considerable depression of feeling in the mining districts of the county, though no one doubts that it is only temporary. Still, the county has suffered so severely in its mining interests during the last few years that there is apparently less elasticity and less readiness to recover than used to be the case. This is not unnatural; indeed, it is not very easy to see how it could be otherwise. Repeated blows must have their effect, and there can be no doubt that the losses of mining adventurers have been severe in the county as well as out of it. "A stern chase is a long chase," and, though one's confidence in the ultimate prosperity of local mining enterprise does not fail, yet it is weary waiting.

We are glad to learn that the mines generally have pretty fair stocks of coal. The price has advanced, in consequence of the lock-out, some 3s. or so per ton, and it may be hoped that this is about the worst. It is really remarkable, seeing how bad the coal usually supplied to Cornwall for mining purposes is, and how large must be the profits of the coal merchants, that more mines do not import their own coal, and, moreover, by contracts render themselves—to a certain extent, at least—dependent of the fluctuations of the markets. The more remarkable is it seeing that the coal charges form such a very heavy item in the expenditure of all our chief mines.

There is good reason to hope that the action taken by the adventurers in Wheal Agar in introducing boring machines will bear ample fruit, and that the mechanical borer will be introduced into several leading mines, at any rate, of the neighbourhood. Undoubtedly the early boring machines were too cumbersome, costly, and complicated. Neither of these charges can be brought against the Darlington borer, and, as it will have a fair trial at Wheal Agar, we may hope that it will remove the reproach under which Cornish mining has laboured of late of being unable to adopt appliances which are in use in almost every other part of the world. A good deal of interest has been manifested in the Tangye borer, described in last week's Journal, with its clever adaptation to the mechanism of the old-fashioned borer beating. We should not be at all surprised to find this implement also put to a practical trial ere long.

A somewhat new form of industry has been introduced into the county, apparatus having been erected at Pons Mill, near St. Blazey, for the purpose of grinding the china-stone, which will be sent away in casks, like the finer sorts of china-clay, instead of in bulk. The machinery will be worked by water-power.

Hardly in any district of the country is mining duller than in the neighbourhood of St. Ives, where the mines have not only to contend against the general causes of depression, but an amount of water unequalled in any other part. Happily, the weather this week has been more favourable, so that we may hope for a speedy improvement in this particular. If mining is dull, however, St. Ives is lively enough; for it has been worked up to an intense pitch of excitement by the proceeding trial of an election petition, presented by Sir F. Lyett against the return of Mr. Praed in December last. Mr. Justice Lush is the judge, and Messrs. Hawkins, Q.C., and Russell, Q.C., are the leading counsel. There are allegations of intimidating miners at St. Ives Consols and Providence.

There appears at last to be some hopes of boring machinery being introduced into Cornwall, so that Cornish miners will be free from the charge that they are behind the rest of the world. At the South Crofty meeting, yesterday, Capt. Josiah Thomas stated that some three or four years ago they tried a boring machine at Dolcoath, and they worked it for 18 months, and the result was that they could not drive any faster than by hand labour, and the cost was something like 20 per cent. more than hand labour. That, therefore, was a failure. Since that time, however, various makers had been making machines and endeavouring to improve them. Recently he saw a machine in Lancashire working in an iron mine, of the most perfect and most simple construction that he had seen. He was very much struck with it. Cornishmen were working it under a Cornish manager and Cornish agents. They had been working it for three or four months, and they can drive three times as fast as by hand labour, and the cost of boring is not more than two-thirds what it is by hand labour.

#### REPORT FROM SCOTLAND.

Feb. 17.—The Warrant Market continued dull all last week, and closed on Friday at 73s. On Monday there was more animation, and a good business was done from 73s. to 73s. 9d. Yesterday the tone was easier, and a few lots changed hands at 73s. 3d. cash, buyers remaining at that price at the close. To-day a limited business was done at 73s. 6d., closing with sellers over, and buyers offering 73s. 3d. There is little or no change to report in the value of makers' iron:—

G.M.B. at Glasgow (deliverable alongside)	No. 1.	No. 2.
Guthrie ditto	74s. 6d.	73s. 6d.
Gairdner ditto	75 0	74 0
Gairdner ditto	75 0	74 0
Burner ditto	75 0	74 0
Langloan ditto	75 0	74 0
Carnbroe ditto	75 0	74 0
Monkland ditto	75 0	74 0
Clyde ditto	75 0	74 0
Govan, at Broomfield, ex store, ditto	75 0	74 0
Calden, at Port Dundas ditto	75 0	74 0
Glenarnock, at Ardrossan ditto	75 0	74 0
Eglinton ditto	75 0	74 0
Dalmellington ditto	75 0	74 0
Carron, at Grangemouth, selected, ditto	75 0	74 0
Shotts, at Leith ditto	75 0	74 0
Kninell, at Boness ditto	75 0	74 0
Bar iron	75 0	74 0
Nail rods	9 10	—

Week ending Feb. 13, 1875	Tons	7,792
Week ending Feb. 14, 1874	Tons	7,138
Increase		654
Total increase for 1875		10,917
Imports of Middlesbrough pig-iron into Grangemouth:—		
For the week ending Feb. 13, 1875	Tons	3,900
For the week ending Feb. 14, 1874	Tons	3,180
Increase		720
Total increase for 1875		4,576

At the close of last week the demand for g.m.b. moderated, and this week the market opened with a scarcity of warrants, and prices advanced, with makers' iron also firmer. Yesterday almost no business was reported on 'Change as a consequence, showing that the advance was the simple result of speculation. The shipments continue low considering the price, and, unfortunately, the advices

from the Continent are becoming less satisfactory as the season advances. There is an increase of shipments on the year to date; but that the increase is not much greater is regarded as proving the want of funds in the hands of foreign correspondents, as many works abroad are waiting the accession of iron for their completion. The moderate price of the article, and its known want for many undertakings, may yet give an impetus to shipments which is not presently apparent. The malleable iron trade, so far as the larger plate and rolling mills are concerned, is still confined within small dimensions; the smaller makers sliding prices up and down in order to secure them as much work as will keep them from shutting. The forges and machine shops are also somewhat quieter, pipe-founders being the only exception. It was expected that works here were likely to book the large orders for water mains which has fallen to the Staveley Iron Company, Sheffield—their rate being reported as under 7l. per ton. Prices are irregular and drooping.

At the annual festival of the managers, firemen, &c., connected with the Mossend Ironworks—Mr. Jas. Neilson in the chair—several excellent remarks were called forth. The Chairman proposed the "Managers of the Mossend Ironworks," coupled with the name of Mr. David Scott, one of the oldest servants of the company. He recommended that the men at the heads of the various departments of the works should prepare papers on the manufacture of iron and the processes to which it was subjected in each department. He assured them that the preparation and study of scientific papers would be more beneficial to them than the drinking of toasts. Mr. David Scott, and others, suitably replied.

The strike of engineers on the Clyde has extended to Glasgow. This time the offence consists of the employers changing the hours somewhat, and the men think this a matter which cannot be tolerated, even though it does not add a minute per week to their present hours of labour. To-morrow night, at the Engineers' Association, a paper will be read on "Light Single-Line Railways."

For Coals there is an extra enquiry from Irish ports, which had been formerly supplied from Wales, and a good coasting trade is the consequence. The shipments this week sum up to a total of 45,499 tons, against 26,143 tons in the same week last year, and the price and the demand are maintained on account of the strike in Wales. Without it prices and shipments would have been less active, and there is some appearance of its continuance for some time to come.

The attempt to carry Scotch coals to London is not likely to be realised at this time, as the present attempts have fallen through, the carrying charges consuming everything else.

In Fifeshire contracts for storing and summer delivery are being entered into under present prices; but as the strike in Wales has also affected the collieries on the East Coast not much more will be done in this way till this matter is settled one way or another. The deliveries of gas coal continue on a large scale, and the business seems on the increase.

Messrs. Thornton and Orr, the liquidators of the Niddrie Coal Company (Limited) have issued a circular to the shareholders, stating that they have made over to the Benhar Company all the property, &c., of the Niddrie for 62,000l. (equal to the paid-up capital of the company), and agreed to accept from the Benhar Company in payment 31,000 new shares of 10l. each, 2l. paid, to be issued to the shareholders of the Niddrie in exchange.

The mining operations which have been carried on at Gourcock for copper ore by Messrs. Henderson and Co. have been entirely suspended, the project not proving successful. The work was commenced about five years since, and the outlay must have been considerable. Mining on a small scale had been carried on at the same place more than a hundred years ago, but whether successful or not cannot be ascertained. The plant, consisting of engines, boilers, &c., is to be removed to Irvine.

**UNDERGROUND TEMPERATURE.**—At the Geological Society of Glasgow annual meeting the President (Sir William Thomson) delivered an interesting address, which was greatly appreciated by the members. The subject dealt with was "Underground Temperature." Sir William explained at the outset that the mathematical theory of underground temperature involved phenomena which might be divided into two classes—periodic and non-periodic. The periodic phenomena occurred over and over again with perfect regularity in successively equal intervals of time; the non-periodic might be approximately periodic, or irregularly periodic, without fulfilling accurately that strict definition. But, on the other hand, the action which had no periodic character whatever might be irregular, or there might be a gradual secular variation. There might be three classes of phenomena—secular variation, irregular variation, and periodic variation. He then described the mathematical theory of Fourier, as applied to the periodic, observing, in passing, that it was equally convenient for dealing with all the three classes. That theory was one of the most beautiful pieces of application to the mathematical instrument they had in the whole history of science. It had constituted a new branch of mathematics, and Fourier, Sir William mentioned, invented it for the purpose of analysing the phenomena of the conduction of heat through solids. He spoke of the investigations of Peleat, Armstrong, Quetlet, Tait, and Forbes into the conductivity of bodies, and he exhibited a diagram showing the results obtained by Forbes from thermometers placed at depths of 3, 6, 12, and 24 ft. below the surface in Craigleith Quarry, the Experimental Gardens, and the Calton Hill, Edinburgh. The result of the observations, which Forbes commenced and Sir William continued, showed that the variations were greater near the surface, that a higher temperature was generally indicated at a later period at the greatest depth, and seemed to show that the sandstone of the Craigleith quarries had a greater conductivity than the trap-rock. Sir William concluded by referring to the temperature of the earth as indicating its internal condition, and he promised at some future time to give the society an other address on a kindred subject.

#### THE SCOTCH MINING SHARE MARKET—WEEKLY REPORT AND LIST OF PRICES.

During the past week a large business has been done. A rise of 1 per cent. has taken place in the Bank rate to-day (now 3 1/2), but this is not likely to affect business. In iron and coal shares the principal changes are a rise of 2 in Nant-y-Glo and Blaenau preferred, while Fife Coal shares have declined 1 1/2, and Merry and Cuninghame 3/4; this last attracted particular attention during the week. In copper, &c., shares there have been no particular movements; attention may be directed to the favourable report just received by the Yorke Peninsula Mining Company (Limited) from their committee of inspection at Adelaide. In Americans, Flagstaff shares are higher, while Colorado Terrible have declined. Javali shares also were at one time lower, and rather dull on the demand lessening, but they have again shown signs of coming into favour on the very satisfactory report from the mine just issued, and they have now a decidedly upward tendency; this report states that the mill had worked 22 1/2 days, crushing 1300 tons of quartz, yielding 628 1/2 ozs. of gold, valued at 1370l. The expenses for the month were 7500l., including 1420l. on capital account, thus leaving a profit on the month's working of 7620l. The figures at this time last year being—1020 tons, yielding 325 ozs., with a profit of only 3645; this shows how greatly the state of affairs has improved with the Javali Company. The attention of investors is likely to continue to be attracted to the shares of a company showing such progress and prospects as the Javali, and in view of this I have given this week full particulars in regard to the company, which will be found after my report of Wednesday's business. In oil shares, Young's Paraffin have again been in good demand, and have advanced about 1/2 per share; others are unchanged. In miscellaneous, Scottish Wagon shares are the only description that have been dealt in; the original shares are unchanged, but the new issue is higher. Among shares not usually quoted North Hendre Lead Mine is 2 to 2 1/2, and Richmond Consols have changed hands at 7 1/2. A detailed list of the several days' business follows:—

On Thursday last a good business was done, attention, however, being chiefly directed to Merry and Cuninghame. Canadian Copper Pyrites done at 1 1/2, closing 30s. to 31s. Cairnstable, 6 1/2 to 6 3/4. Ebbw Vale firm at 20 to 20 1/2. Emma done at 36s., closing 35s. to 36s. Port Washington (all paid) done at 4 1/2, closing 4 1/2 to 5. Javali easier on realisations, closing 7s. 6d. to 8s. 6d. Lochore and Capletrae, 7 1/2 to 7 3/4. Marbella, 106s. to 107s. Merry and Cuninghame shares opened at 57s., but on sales continuing to be pressed gradually declined, closing 53s. to 55s. 6d. Monkland ordinary done at 61s. and 62s., closing at these prices. Nant-y-Glo and Blaenau preferred rose 2, at 41 to 43. Orma and Cleland done at 2 1/2. Tharsis dull, done at 22 1/2 and 23 1/2, closing about these prices. Young's Paraffin shares again good, done at 5 1/2, closing 5 1/2 to 5 3/4. Scottish Wagon original shares at 11 1/2 to 11 3/4, and new shares changed hands at 26s. Yorke Peninsula ordinary about 5s. to 6s.

On Friday a good business was done. Bolckow, Vaughan, A, done at 55 1/2, closing 55 to 55 1/2. Cairnstable, 6 1/2 to 6 3/4. Canadian Copper Pyrites, 30s. 6d. to 31s. 6d. Ebbw Vale done at 20 1/2, closing 20 to 20 1/2. Emma done at 1 1/2, closing 34s. 6d. to 35s. 6d. Glasgow Caradon, 25s. to 25s. 6d.; these shares are now quoted ex div. Javali remain at 7s. 6d. to 8s. 6d., the enquiry for them seeming to have lessened. Lochore and Capletrae done at 7 1/2, closing 7 1/2 to 7 3/4. Marbella opened at 107s., but gradually declined to 5 1/2, closing 105s. to 106s. Merry and Cuninghame were again largely dealt in, and continue to be pressed for sale; the opening price was 53s. 6d., but transactions took place down to 50s., closing 49s. 6d. to 50s. 6d. Monkland ordinary done at 61s., but improved to 63s., buyers, closing flat again, at 60s. to 61s. Orma and Cleland done at 50s., closing 50s. to 51s. Panulillo, 7 1/2 to 1 1/2. Tharsis were more dealt in; opened at 22 1/2, but steadily advanced, closing



In one or two branches of the Sheffield trade, there has been a little improvement, but there are a good many men still only partly employed. The heavy plate and other mills have been doing very well, and there is a rather better enquiry for the finer qualities of table and other cutlery. Bessemer rails and forgings have undergone



no change, but there is no doubt there will be a better demand for the steel rails as the season advances, for our home companies are agreed that they are far more economical than the ordinary iron ones, especially where the traffic is heavy. In malleable iron goods business has been steady at the leading establishment in the town—that of Messrs. Crowley and Son—so noted for its productions of plain and ornamental iron. At Attercliffe and other outlying places connected with Sheffield business appears to be tolerably good. The South Yorkshire Coal Trade is not so brisk as it has been, and prices have fallen of late for most qualities. During the last few days more than one colliery has been standing, owing to a want of wagons, which are to be seen at many stations loaded. It is now evident that our productive power is getting far in advance of what is required for consumption, and with the many new collieries being opened out in all directions this, before long, will be the case to a much greater extent than it is even now. The dispute at the Thin coal collieries in the Dewsbury district continues, but there are indications that it will not last much longer.

**Messrs. Briggs, and their system of industrial partnership.**—The report of Henry Briggs, Son, and Co. (Limited) for the last half year announces the break-up of the system of industrial partnership, so far as applied to the mines of the company. The half-yearly meeting of shareholders was held at Whitwood on Monday, Mr. H. Currier Briggs, Chairman of the company, presiding. The report was adopted, and a resolution to discontinue payment of bonus was submitted and carried. An amendment, that it be paid as usual, on wages was moved by Mr. J. Alexander, and seconded by Mr. H. Bainley, though receiving a greater show of hands, fell to the ground, as the directors held at least two-thirds of the shares, and therefore two-thirds of the votes. The Chairman expressed his regret that the directors had been obliged to submit such a resolution, and said the industrial partnership system had been thrown back for a century by the recent action of the men.

#### REPORT FROM NORTH AND SOUTH STAFFORDSHIRE.

Feb. 18.—The tone of the South Staffordshire Iron Trade must again be pronounced weaker, both in the pig and finished departments. In both cases the weakness is most noticeable in the cheaper classes of production. Common cinder-pig is affected by the large arrivals of pig-iron of corresponding quality from the North Country districts, and sales have been reported at 3s. 2s. 5d., being 2s. 6d. per ton under last quotations. A fair medium class of pig, made of mixed mine and cinder, is offering at 4s. per ton. The leading makers of best pig-iron, especially of the class used in the foundries, experience a fairly steady trade. Further attention is being given in various parts of the district to the need for economizing the production of pig-iron by a modification of the arrangements of the furnaces, which will secure the consumption of the smoke and gaseous vapours now permitted to escape in waste. It is, however, improbable that the furnaces being thus manipulated will be set in operation until the aspect of business improves. The finished iron trade is fairly steady in the best classes, sheets and plates being still the more prominent features of enquiry. Marked bars are well sustained at the standard of 10s. 10s., 11s., and 11s. 12s. 6d. per ton. Common unmarked bars are changing hands at as low a figure as 8s. 17s. 6d. per ton, and the demand is very much restricted, many of the smaller mills and forges being only in partial operation. There is a scarcity in the manufacture of corrugated roofing, and the Darlaston Galvanising Company (Limited) contemplate erecting a sheet rolling-mill adjacent to their newly-finished works at Darlaston Green as the best solution of the difficulty, which is a periodically recurring one, of obtaining in adequate quantity supplies of material. Some orders for hoops on Spanish account are being given out, and there are moderate enquiries for guide, horse-shoe, and rod-iron of the better class.

The South Staffordshire Coal Trade is a degree quieter, but with the exception of Cannock Chase slack, which has been reduced 1s. to 1s. 6d. per ton, prices remain unchanged. Some of the commonest class of furnace coal is quoted 9s. per ton, but nothing of a reliable quality is obtainable under 10s. at the pits. In the Pelsall district deep coal is firm at 13s. per ton, and the Thick coal masters around Dudley and West Bromwich are not making any concessions on the prices last quoted. Ironstone is in steady request, and prices are well supported. Limestone for flux in iron smelting is in restricted supply, and some inconvenience at the blast-furnaces of the district is felt in consequence. The falling off in the arrivals is ascribed not to any deficiency in the yield, but to the inability of the carrying companies to deal adequately with the traffic.

Several new mining enterprises in and around the South Staffordshire district, one or two of considerable importance, are about to be launched shortly.

To-day's quotations on the Birmingham Stock Exchange included the following:—Sandwell Park Colliery (Limited), 35s. sellers; Patent Nut and Bolt, 5s. 3d. prem.; John Bagnall and Sons (Limited), 5s. 3d.; Cannock and Huntington Colliery Company, 3s. 3d.; Ivy House and Northwood Colliery (Limited), par to 1/4 prem.; Chillington Iron Company (Limited), 6s. Gloucester Wagon (Limited), 15s. Birmingham Wagon (Limited), 19s. buyers.

The Earl of Dudley's new colliery at Lye Cross, near Rowley, commenced operations this week. This sinking was, it will be remembered, through the Rowley basalt, where the coal had been proved by adjacent collieries. The Lye Cross pit is 280 yards deep, and so efficient and well appointed is the plant that the time occupied in descending or ascending the shaft is not more than 15 seconds. This colliery opens out on the estate of the noble Earl 500 acres of splendid Thick coal. The plant and machinery have all been designed and erected under the superintendence of Mr. Latham, one of his lordship's agents, to whose ability and judgment they do great credit.

The Coalbrookdale Foundry (Shropshire) is largely engaged on heavy castings, principally connected with railway work.

There is moderately sustained activity in the Iron Trade of the North Staffordshire district. The merchant bar mills are doing 8 to 10 turns per week. Bars of the heavier class are only in moderate demand. The rate for crown bars is 2s. 6d. easier, at 9s. per ton.

[For remainder of Business Correspondence, see page 193.]

**ENGINE (One 8-horse power semi-portable) TO BE SOLD.**—CHEAP, to cover advances, with funnel 36 ft. high. ONE 8-horse power grasshopper ENGINE, by Easton and Amos, with a set of three-throw gun metal PUMPS; 4 1/2 ditto brass glands and buckets; three can be separated. ONE 8-horse power high-pressure direct-acting ENGINE. ONE 8-horse power marine ENGINE, highly finished, fit for a small launch. ONE set of three-throw 3-in. gun metal PUMPS, brass glands and buckets, copper connecting rods, and a three-throw wrought-iron crank. ONE highly finished self-acting LATHE, 18 ft. beds, eight centres, saddle, and universal chuck; two-planned iron saw benches, to take in 24 in. saws, with patent rollers and patent bearings; three lengths of 2 1/2 shafting, 97 ft. run, with 14 in. hangers and four mitre wheels, and three double purchased crabs, with 14 in. and 16 in. pulleys. Address, Mr. W. P. FRANCE, Priory Lodge, Peckham.

**FOR SALE, ONE PAIR OF horizontal direct-acting double action condensing PUMPING ENGINES;** cylinder, 35 1/2 in. diameter, 36 in. stroke; pumps, 2 1/2 in. diameter, 36 in. stroke; fly-wheel, 14 ft. diameter; about 10 tons. Will lift 2800 gallons a minute 160 ft. high. Have been very little used. For further particulars, address, Mr. W. P. FRANCE, Priory Lodge, Peckham.

#### PIT SINKING AND WINDING COAL.

**FOR SALE, and ready for immediate delivery, a 14, 18, 25, and 36 horse power PORTABLE STEAM ENGINES, with link motion reversing gear, winding drum, gear, &c., complete.** Also, a 9 and 18 horse power VERTICAL ENGINES, with link motion reversing gear, suitable for mining operations.

**FOR SALE, an excellent PORTABLE STEAM ENGINE; and a 7-ft. PAN MORTAR MILL.** Apply to—BARROWS AND STEWART, ENGINEERS, BANBURY.

**FOR SALE, a HORIZONTAL HIGH-PRESSURE ENGINE,** 13 1/2 in. cylinder, 24 in. stroke; HORIZONTAL HIGH-PRESSURE ENGINE, 14 in. cylinder, 30 in. stroke; and a PAIR OF GUN-METAL PUMPS, 6 in. diameter, 12 in. stroke; also, a TUBULAR BOILER, up to 60-horse power, of Yorkshire plates throughout. Apply to W. T. HENDRY and Co., 2, Wilson-street, London E.C.

**TANK LOCOMOTIVES, double 9 in.,** cheap, strong, and well finished; portable ENGINES, from 4 to 30 horse power—always ready, or in a forward state, with or without winding or pumping gear; vertical ENGINES and BOILERS, of improved design. Apply to—LEWIN, POOLE WORKS, DORSET.

#### In the Court of the Vice-Warden of the Stannaries. Stannaries of Cornwall.

**IN THE MATTER OF THE COMPANIES ACT, 1862, and of the GREAT WORK CONSOLS MINING COMPANY.**—Notice is hereby given, that a Petition for the Winding-up of the above-named company by the Court was, on the 15th day of February instant, presented to the Vice-Warden of the Stannaries, by Joseph Walker Tynock, of Helston, within the Stannaries of Cornwall, gentleman, a shareholder of the said company, and that the said petition is directed to be heard before the Vice-Warden, at the Prince's Hall, in Truro, within the said Stannaries, on Monday, the 1st day of March next, at Twelve o'clock at noon.

Any contributory or creditor of the company may appear at the hearing and oppose the same, provided he has given at least two clear days' notice to the petitioner, his solicitors, or their agents, of his intention to do so, such notice to be forthwith forwarded to P. F. Smith, Esq., Secretary of the Vice-Warden, Truro.

Every such contributory or creditor is entitled to a copy of the petition and affidavit verifying the same from the petitioner, his solicitors, or their agents, within 24 hours after requiring the same, on payment of the regulated charge per folio. Affidavits intended to be used at the hearing, in opposition to the petition, must be filed at the Registrar's Office, Truro, on or before the 26th day of February instant, and notice thereof must, at the same time be given to the petitioner, his solicitors, or their agents.

**HODGE, HOCKIN, AND MARRACK, Truro, Cornwall** (Petitioner's Solicitors).  
**GREGORY, ROWCLIFFES, AND RAWLE, 1, Bedford-row, London** (Agents of the said Solicitors).

Dated Truro, 17th February, 1875.

#### WHEAL MARY ANN MINE.

Near Liskeard, one mile from Menheniot Station on the Cornwall Railway.  
**SALE—TUESDAY, WEDNESDAY, AND THURSDAY, 23rd, 24th, and 25th February, 1875.**

**MR. SPRY has received instructions to SELL, BY PUBLIC AUCTION, on the days above mentioned, at Twelve o'clock (noon) precisely, on WHEAL MARY ANN and TRELAUNY MINES, situate in the parish of Menheniot, in the county of CORNWALL, nearly 1000 lots of very superior MINING PLANT, MACHINERY, AND MATERIALS, COMPRISING**

ONE 80 inch cylinder PUMPING ENGINE, 10 ft. 6 in. stroke, equal beam, with FOUR 10 ton BOILERS, brass bucket, brass-lined well-work, &c. It is considered that this lot cannot be excelled by any similar engine in the county.  
ONE 70 inch cylinder PUMPING ENGINE, 10 ft. stroke, equal beam, with FOUR 10 ton BOILERS, &c.  
ONE 45 inch cylinder BULL ENGINE, 7 feet stroke, equal beam, with new well-work, brass bucket, &c.  
ONE 26 inch cylinder WINDING ENGINE, 7 ft. stroke, equal beam, with ONE 8 ton BOILER, eccentric gear, and windch.  
ONE 24 inch cylinder WINDING ENGINE, 6 ft. stroke, equal beam, with TWO 9 ton BOILERS, and winch.  
ONE 22 inch cylinder ENGINE, 5 ft. stroke, equal beam, with ONE 8 ton BOILER, winch, grinder and stamps (12 heads).  
ONE 23 inch cylinder HORIZONTAL WINDING ENGINE, 5 ft. stroke, with ONE 8 ton BOILER.

The CASTINGS of an ENGINE.  
Capstan, stand, and stays. Shears, stays, and pulleys.  
PITWORK of every description—an immense quantity, from 9 to 15 in.  
Plunger poles of various sizes, cast-iron balance and angle bars, three water-wheels, steam capstan, punching machine, fire whip cone, weightbridge (9 tons), strapping plates from 5 to 7 inches, staples and glands, flange and rod pins, large and small pulleys, side screws, brass valves and seatings, brass plate for bucket.  
200 fms. best steel wire rope, 3/4 inches, good as new.  
195 fms. 1/2 in. chain.  
Ladders, bridge rails, rail iron, tram wagons, tram wheels, large bell, turning lathe (back gear), large beam scales and weights, several large and small wood sheds and cisterns.

A vast quantity of brass, steel, cast and wrought iron.  
Prime half and square timber, plank, &c., &c.  
The best machinery and materials having been invariably purchased for these mines, and many of the lots having had very little wear, it is respectfully intimated to Engineers, Mine Proprietors, and Agents, who require to purchase, that it will be to their advantage to attend this important sale.

The engines will be offered on the first day of sale, and the pitwork, &c., &c., immediately afterwards, and on the subsequent days.

Intending purchasers are invited to luncheon in the counting-house on Wheal Mary Ann Mine, each day, at Eleven o'clock in the forenoon.

Further particulars are contained in descriptive catalogues, which can be obtained of Mr. W. G. NETTLE, the Purser, Liskeard; or of the Auctioneer, Liskeard. Dated January 30, 1875.

#### IMPORTANT TO SLATE QUARRY PROPRIETORS, CAPITALISTS, AND OTHERS.

**SALE OF THE VALUABLE SLATE AND SLAB QUARRY, KNOWN AS THE CROSSOR UNITED SLATE COMPANY (LIMITED).**

**Messrs. Wm. Dew and Son will sell, BY PRIVATE TREATY, subject to conditions, the above very extensive and valuable SLATE QUARRY, where there is a large deposit of slate rock second to none in the Principality.**

The slate ground extends over 370 acres, only 10 acres of which have as yet been explored. There are also 199 acres of tipping ground. The celebrated

#### FESTINOG SLATE VEIN.

The same as the Welsh Slate Company's, runs under the whole of the property. It is held under a lease of which 46 years are unexpired, with power to claim extension for 20 years. The present dead rent is £350, and in September, 1875, it becomes £600, merging into royalty varying from 1-14th to 1-10th, according to the quantity annually sold.

The slates are of excellent quality, and find a ready market. A tramway from the quarry to Port Madoc, to the construction of which the company contributed a large sum of money, affords every facility for the cheap and expeditious conveyance of the slate to the place of shipment, and the company have a contract for the use thereof, on very moderate terms.

There are very extensive saw mills, with two powerful water wheels; sawing tables, planing tables, slate dressing machines, and other machinery for working saw mills; a long tunnel for drawing and working the quarry; extensive railway inclines, wagons, two 12 horse power locomotives, steam engines, put up for temporary purposes; ventilating fan; two excellent dwelling-houses, barracks, workshops, stables, &c.

For further particulars and plans, apply to Messrs. JENNINGS, WHITE, and BUCKSTON, Solicitors, 5, Whitehall-place, London; Mr. J. E. JONES, Secretary, Port Madoc; Mr. T. WILLIAMS, Agent, at the quarry; and to Messrs. Wm. Dew and Son, Auctioneers, Wellfield House, Bangor, and High-street, Rhyl.

#### ROCKS TIN MINE, ST. AUSTELL.

**VALUABLE MINE MACHINERY AND MATERIALS FOR SALE.**

**TO BE SOLD, BY PUBLIC AUCTION, at Rocks Tin Mine, in the parish of St. Austell, in the county of Cornwall, by Messrs. HANCOCK AND SON, on Tuesday, the 2nd day of March next, at One o'clock in the afternoon precisely, the WHOLE of the**

#### VALUABLE MACHINERY AND MATERIALS

on the said mine, comprising—ONE 29 in. cylinder rotary STEAM ENGINE, with two heavy fly-wheels; and ONE BOILER, about 10 tons.

ONE small horizontal (donkey) ENGINE, by Wilson, Vauxhall, 1 1/2 in. diameter, and 3 in. stroke.  
Four 12-head iron STAMPS AXLES, iron and wood frames and lifters, 48 stamp heads, drags, &c.

Blake's Patent STONE BREAKER, by R. Marsden, Leeds, with a cylindrical screen.

ONE 12 fm. 8 in. PLUNGER LIFT.  
ONE 10 fm. 7 in. DRAWING LIFT.  
ONE 9 fm. 6 in. DRAWING LIFT.

Iron rods, pulleys, stays and bolts, 7 Williams's patent and several other bud dies, with gear work complete, shears, stays and shives, wood houses and sheds, tin kieves, racks, iron winding cage for steam whim, horse whim, 40 fms. 3/4 in. whim chain, other ditto, tram wagons, small boiler (about 2 tons), about 30 cwt. of new cast borer steel, miners' and smiths' tools, including 36 in. smiths' bellows, samplers' beam, scales, and weights (in glass case), blocks with chains, screwing stock, boring machine, a quantity of 2 in. and 1 1/2 in. iron tubing, 4 in. cast pipes, Norway bark and other timber, wood hand pump, new and old brass, sieve, copper bottom and other dressing tools, 21 tin bakes, dynamite, crab winch, grinding stone, the castings of a direct acting patent steam stamps, and sundry other articles in general use in mines: also, the account house furniture.

Further particulars may be known on application to the Auctioneers; or of Messrs. HODGE, HOCKIN, AND MARRACK, Solicitors, Truro.

Dated Truro, Feb. 18, 1875.

**FOR SALE, BY PRIVATE BARGAIN, the WHOLE LEASES, STEAM ENGINE, WATER WHEEL, PLANT, MACHINERY, STOCK AND EFFECTS, belonging to**

#### THE GALWAY MINING COMPANY (LIMITED),

Of and on the various ESTATES held on Mineral Lease by the company, near OUGHTERARD, in the county of GALWAY.

Apply to Capt. FLOYD, Wellfield, Oughterard, who will show the ground and give explanations as to workings; or to the Subscriber as to the Assignment of Leases, and for all other particulars. J. H. M. BAIRNSFATHER.

Hamilton, N.B., 8th February, 1875.

#### TO CAPITALISTS.

**FOR SALE, IN NEW SOUTH WALES, —**

1340 ACRES TIN LANDS, —Lode and Stream.

2480 ACRES COPPER LANDS (portions freehold).

2112 ACRES IRON AND COAL.

2280 ACRES COAL (on sea coast).

4000 ACRES COAL (inland, on railway line).

200 ACRES KEROSENE SHALE.

200 ACRES PLUMBAGO.

105 ACRES FREEHOLD GOLD DEPOSIT (Brown's Creek).

The above properties are all first-class, and on or near railway lines or water carriage, and are the very "pick" of their respective districts (being some of the first selections made).

Liberal terms, either as to purchase or working on royalty, will be given to parties able to carry out arrangements.

Apply to the owner.

CHARLES W. WEEKES, Circular Quay, Sydney, N.S.W.

#### C O A L S.

**CONTRACT DEPARTMENT, ADMIRALTY, WHITEHALL, S.W., 10th FEBRUARY, 1875.**

**TENDERS will be RECEIVED, until Two o'clock on Thursday, the 25th inst., for the SUPPLY OF LAND ENGINE, FURNACE, METAL MILLS, SMITHERY, COKE, BAKERY, and HOUSEHOLD COALS, to Her Majesty's Dockyards, Victualling Yards, Royal Marine Barracks, Naval Hospitals, &c.**

The contracts are for specific quantities, and for forward delivery within stated periods.

Tenders may be made for the whole or any portion of the quantities required. Their Lordships do not bind themselves to accept the lowest or any tender, and they reserve to themselves the power of accepting any part of a tender.

Forms of tender, containing all particulars, may be obtained on personal or written application to this office.

FRANCIS W. ROWSELL, Superintendent of Contracts.

**PURSUANT to a Decree of the High Court of Chancery, made in a Cause INGHAM against RICHARDSON (1875 I 5), the CREDITORS of JAMES STANSFIELD, late of Todmorden, in the county of York, who died in or about the month of November, 1874, are, on or before the 22nd day of March, 1875, to send by post, prepaid, to WILLIAM SAGER, of Todmorden, in the county of York, the solicitor of the defendant, Hannah Stansfield, the administratrix of the deceased, their Christian and Surnames, addresses, and descriptions, the Christian and surnames in full of any partner or partners, the particulars of their claims, a statement of their accounts, and the nature of the securities (if any) held by them, or in default thereof THEY WILL BE PEREMPTORILY EXCLUDED FROM THE BENEFIT OF THE SAID DECREE.** Every creditor holding any security is to produce the same before the Vice-Chancellor Sir James Bacon, at his Chambers, situated No. 11, New-square, Lincoln's Inn, in the county of Middlesex, on Wednesday, the 7th day of April, 1875, at Twelve o'clock at noon, being the time appointed for adjudicating on the claims.

Dated this 12th day of February, 1875.

EDWARDS, LAYTON, and JAMES, 8, Ely-place, E.C., agents for Holroyde and Smith, Halifax.

#### TO MANUFACTURERS, PATENTEES, AND CAPITALISTS.

**EXTENSIVE ROOMS AND PREMISES, with RESIDENCE, near a large COLLIERY, IRON WORKS, and RAILWAY, suitable for a MANUFACTORY or BREWERY.** Steam power and warming apparatus fixed. TO BE LET, OR SOLD.

Apply to Messrs. OLIVER, NEWBOLD, and OLIVER, Auctioneers, Derby.

#### SLATE QUARRY IN NORTH WALES.

**A GOOD SMALL CONCERN FOR DISPOSAL, now belonging to a Private Gentleman, and making a net profit of over £150 per annum, which with small additional outlay may be greatly increased.** Particulars may be obtained on application to FRYNE and ASHMEAD, 6, Bishopsgate Without, London, E.C.

**FOR SALE, in Dean Forest, a VALUABLE COLLIERY, containing THREE HUNDRED AND FIFTY-ONE ACRES in FOUR SEAMS OF COAL.** Particulars, &c., may be had of Messrs. ATKINSON and VAUGHAN, Mining Engineers, Coleford, Gloucester-shire; and M. W. T. SCOTT, Esq., M.E., 4, Westminster Chambers, Victoria-street, London.

#### FIRE-CLAY AND BRICK WORKS.

**FOR SALE, a MOIETY of the LEASE of a CLAY SETT, comprising TEN ACRES, at a low royalty.** The greater portion of the purchase money to be laid out in extending the works. The supply of clay is almost inexhaustible. None but principals treated with.

Address, "Kaolin," MINING JOURNAL Office, 26, Fleet-street, London.

#### PUG MILL.

**FOR SALE, ORE-MIXING MILL, by CLAYTON, 6 ft. high, by 4 ft. diameter, which has never been used.**

Details on application to Kapunda Copper Company (Limited), 21, West Nile-street, Glasgow.

**FOR SALE, a 28-in. cylinder rotary condensing ENGINE, with pumping gear, complete; and TWO BOILERS.** Application to be made to Mr. J. KITTO, Llanidloes, Montgomeryshire.

#### CORNISH ENGINES.

**FOR SALE: —** ONE excellent 70 in. CORNISH PUMPING ENGINE, 10 ft. stroke, with metallic piston, with three boilers, 13 tons each, with fittings.

ONE good 72 in. CORNISH BEAM ENGINE, 10 ft. stroke, with inverted cylinder.

ONE superior 50 in. CORNISH PUMPING ENGINE, 10 ft. stroke.

ONE first-class 28 in. WINDING ENGINE, 6 ft. stroke, suitable for a colliery, with drum.

ONE very good 20 in. horizontal WINDING ENGINE, 10 ft. stroke.

PUMPWORK of all sizes; CONWY CRUSHERS; BOILERS from 6 to 12 tons; and a LARGE STOCK of MATERIALS in general use in mines.

Apply to F. W. MICHELL and Co., Mine Material Depot, East Carn Brea, Redruth, Cornwall.

**FINE OPPORTUNITY FOR MAKING A FORTUNE.**

**TO BE SOLD, PART or ENTIRE (former preferred) of a COLLIERY ROYALTY, of about 170 acres, in NORTH WALES.** The pit is sunk 40 yards deep to the seam containing the best description of Cannel. There are six other seams of good coal (the first being King Coal, only 14 yards under it) known to be beneath this seam. Its situation being half a mile from a railway station, and also admirably adapted for land sale, close to excellent roads, the working expenses, royalty, rent, and outlay small for a probable get in a few weeks of 40 tons daily at an almost fabulous profit, render the present undertaking one well worthy the immediate attention of capitalists, coal dealers, gas manufacturers, or colliery proprietors.

Address, "Q. E. D.," care of Mr. Watson, 15, Fenwick-street, Liverpool.

**MINING MACHINERY AND MATERIALS FOR SALE,** comprising STEAM ENGINES, WATER WHEELS, PITWORK, and other MINE MATERIAL. —Apply to—W. TREGAY REDRUTH

**ON SALE, TWO CORNISH BOILERS, 30 ft. by 7 ft. diameter.** Two fires through each. Safe at 60 lbs. pressure working.

Apply to HENRY PARKINSON, Foundry-street, Bolton.

**ON SALE, ONE PAIR of 18 in. high pressure HORIZONTAL ENGINES, for winding, fitted with slot link motion. First-class pair of engines.** Apply to HENRY PARKINSON, Foundry-street, Bolton.

**ON SALE, ONE PAIR of 15 in. HORIZONTAL WINDING ENGINES, with slot link motion. Will be sold cheap.**

Apply to HENRY PARKINSON, Foundry-street, Bolton.

**ON SALE, ONE 25-horse power double cylinder PORTABLE ENGINE, fitted with slot link motion for winding.**

ONE 20-horse power double cylinder PORTABLE ENGINE. Will be sold cheap, and are in first-class order.

Apply to HENRY PARKINSON, Foundry-street Boiler Works, Bolton, Lancashire.

**ON SALE, ONE 8-horse power PORTABLE ENGINE, fitted up with winding drum; slot link motion; made by Clayton and Shuttleworth. Price £130.**

Apply to HENRY PARKINSON, Foundry-street, Bolton.

**ON SALE, ONE PAIR of 25-in. coupled HORIZONTAL WINDING ENGINES, with drums and brake gear. Also, ONE PAIR of 22 in. ditto. Will be sold cheap.**

Apply to HENRY PARKINSON, Foundry-street, Bolton.

**ON SALE, ONE STRONG WELL-BUILT CONDENSING BEAM ENGINE, by a first-class maker, equal to new; cylinder, 36 in. bore, 5 ft. stroke. Can be seen standing, and will be sold cheap.**

ONE close built self-contained CONDENSING BEAM ENGINE, stands on independent bed on six columns; cylinder, 28 in. bore, 4 ft. stroke. As good as new. Can be seen standing, and will be sold cheap.

Apply to HENRY PARKINSON, Foundry-street, Bolton.

**BOILERS ON SALE.—FOUR GALLOWAY'S PATENT BOILERS, 30 ft. by 7 ft., safe to work at 70 lbs. on the square inch.**

TWO BOILERS, 28 ft. by 7 ft., with two fires through.

ONE BOILER, 20 ft. by 7 ft., two fires through.

ONE BOILER, 18 ft. by 6 ft. one fire through. Also, several smaller sizes.

Apply to HENRY PARKINSON, Foundry-street, Bolton.

**ON SALE, ONE 16 horse power double cylinder PORTABLE ENGINE, for winding.**

ONE 12-horse power PORTABLE ENGINE.

ONE 10-horse power PORTABLE ENGINE.

ONE 8-horse power PORTABLE ENGINE.

ONE 6-horse power PORTABLE ENGINE.

Equal to new, and will be sold cheap.

Apply to HENRY PARKINSON, Foundry-street, Bolton.

**ON SALE, ONE PAIR of 25-in. HORIZONTAL WINDING ENGINES.**

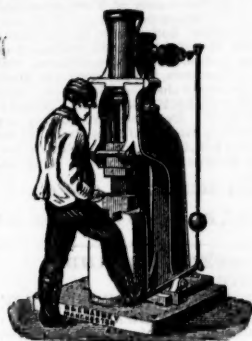
ONE PAIR of



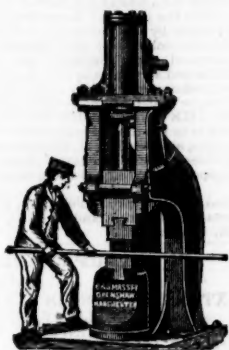
# B. & S. MASSEY, OPENSHAW, MANCHESTER.

PRIZE MEDALS AWARDED:—Paris, 1867 Havre, 1868; Highland Society, 1870; Liverpool, 1871; Moscow, 1872; Vienna, 1873.

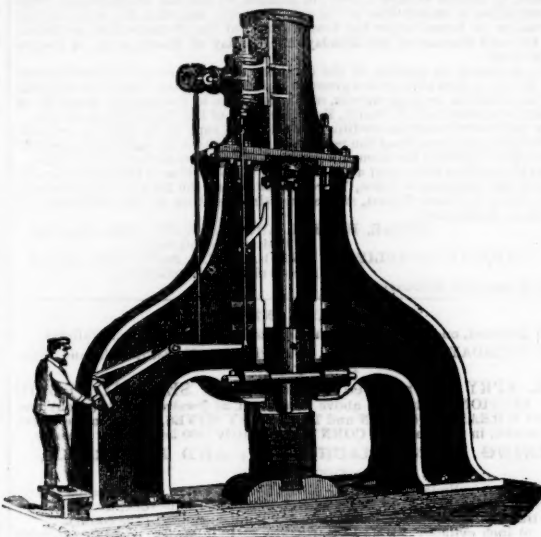
Patentees and Makers of Double and Single-acting STEAM HAMMERS of all sizes, from  $\frac{1}{4}$  cwt. to 20 tons, with self-acting or hand motions, in either case giving a perfectly DEAD BLOW, while the former may be worked by hand when desired. Large Hammers, with Improved Framing, in Cast or Wrought Iron. Small Hammers, working up to 500 blows per minute, in some cases being worked by the Foot of the Smith, and not requiring any separate Driver.



Small Hammer with Foot Motion.



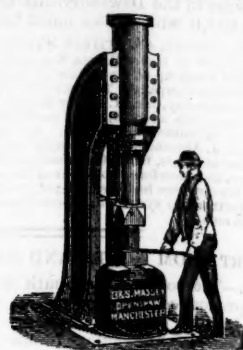
General Smithy Hammer.



Steam Hammer for Heavy Forging.



Special Steam Stamp.



General Smithy Hammer.

From 60 to 100 Steam Hammers and Steam Stamps may usually be seen in construction at the Works.

**SPECIAL STEAM STAMPS**, of great importance for Forging, Stamping, Punching, Bolt-making, Bending, &c. **STEAM HAMMERS** for Engineers, Machinists, Shipbuilders, Steel Tilters, Millwrights, Copper-smiths, Railway Carriage and Wagon Builders, Colliery Proprietors, Ship Smiths, Bolt Makers, Cutlers, File Makers, Spindle and Flyer Makers, Spade Makers, Locomotive and other Wheel Makers, &c.; also for Use in Repairing Smithies of Mills and Works of all kinds; for straightening Bars, bending Cranks, breaking Pig-iron, &c.

## BARROWS & STEWART, ENGINEERS, BANBURY,

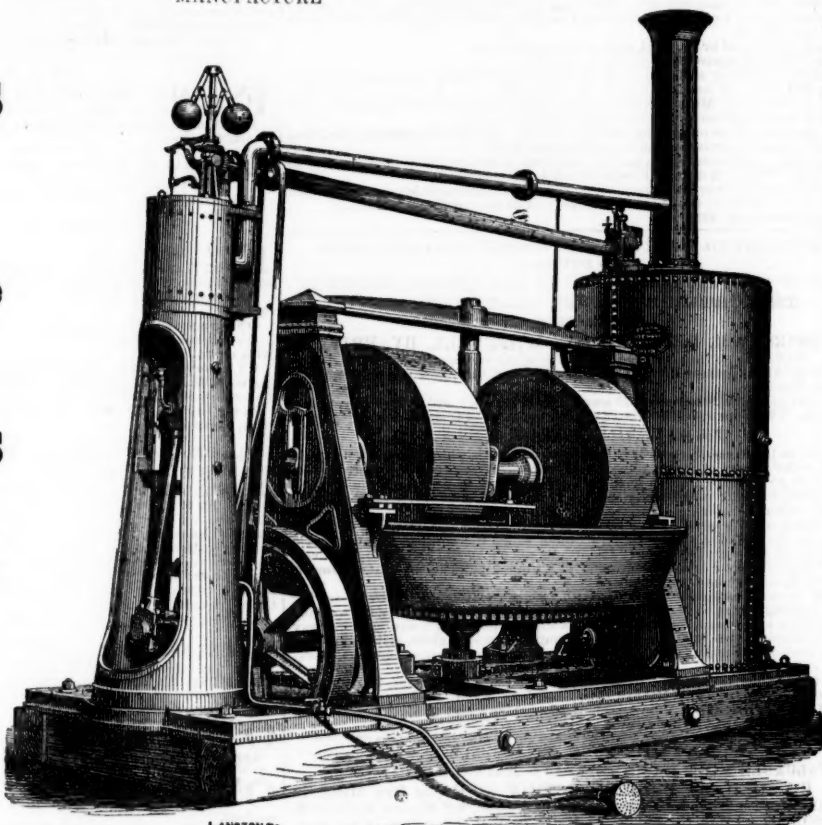
MANUFACTURE

PORTABLE  
Steam Engines

With Gear for  
Winding,  
Pumping, and Ore  
Crushing.

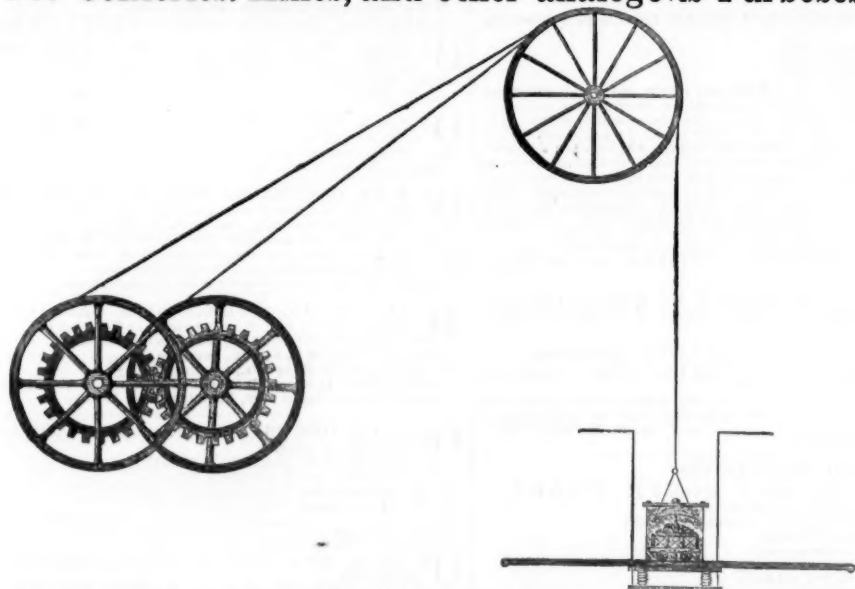
ALSO,

COMBINED MILLS  
and ENGINES,  
with or without  
BOILERS,  
for Grinding  
Cinders, Sand,  
Mortar, &c.



LANCASHIRE

**WILSON'S PATENT WINDING GEAR,**  
For Collieries, Mines, and other analogous Purposes.



The ADVANTAGES of this Patent is to ECONOMISE the WEAR and TEAR of the ROPES and MACHINERY used in drawing or lowering weights in Mines, or any other similar purposes. At a mere nominal cost this patent can be applied to any or every Mine now in operation, while its application to any new plant will scarcely make any difference in time or cost.

Applications for Licence to use the said Invention can be made to the Patentee,—

**R. WILSON, PHENIX WORKS, ROTHERHAM.**

Full particulars on application can be had as to terms, drawings, &c., &c.

**TEAMS**  
Patent Hemp & Wire Rope Works,  
GATESHEAD-ON-TYNE.

**DIXON, CORBITT, AND SPENCER,**  
MANUFACTURERS of every description of ROUND and FLAT ROPES of any length for COLLIERY, RAILWAY, AGRICULTURAL, SHIPPING, and other purposes, and guaranteed of the highest standard of strength. Best Selected Charcoal Iron, Best Crucible Cast Steel, and extra strong Improved Steel Round and Flat Wire Ropes; Compound laid non-rotating Flexible Ropes, in Iron or Steel for small gear and sinking purposes; Best Selected Charcoal Iron Guide Ropes; Galvanised and Plain Ropes for capstans, crabs, suspension bridges, canal towing, &c.; Patent Steel Plough Ropes; Galvanised Signal and Fencing Strands; Copper Rope Lightning Conductors; Steel, Iron, and Copper Sash Cords; Picture Cords; Russian, Italian, and Manila Hemp Round and Flat Ropes; White and Tanned Hemp and Flax Spun Yarns; Round and Flat-rope Pulleys and Patent Springs for same; Galvanised Wire Rope for Ships' Standing Rigging; Russian, Italian, Manila, and Coir Cordage; Towlines, Warps, Service and other Lines for Shipping Purposes; Ships' Rigging fitted by experienced workmen.

D., C., and S. beg to call special attention to the advantages to be derived by adopting their EXTRA STRONG IMPROVED STEEL ROPES, for lifting heavy loads in deep mines, also in hauling from long distances; a considerable reduction is effected in weight, friction materially reduced, and an extra amount of work got out of the rope—a rope 8 lbs. per fathom being equal in strength to an iron rope 20 lbs. per fathom, or an ordinary steel rope 12 lbs. per fathom.

### COPPEE COKE OVENS.

Complete information respecting these  
**PATENT COKE OVENS**  
may be obtained from the  
**COPPEE COKE COMPANY**  
(LIMITED),  
94, GRACECHURCH STREET, LONDON, E.C.

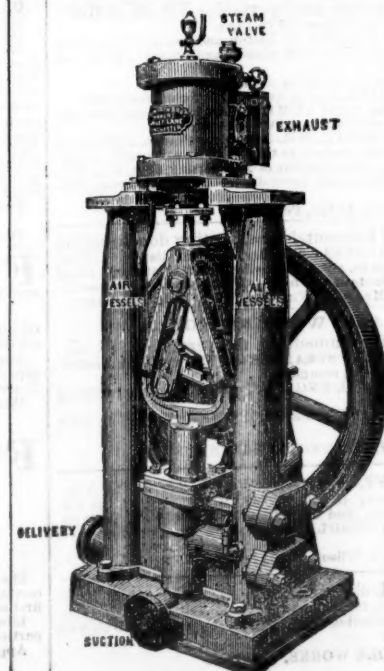
THE  
**PHOSPHOR BRONZE**  
COMPANY (LIMITED).



OFFICES:  
139, CANNON STREET, E.C.  
FOUNDRY:  
115, BLACKFRIARS ROAD, S.E.

INGOTS, Nos. I and II, suitable for Pumps, Pinions, Ornamental Castings, &c. £130 per ton  
Nos. VI. and VII., suitable for Valves, Plungers, Bushes and Bearings, Fans, &c. £145 per ton  
Special Phosphor Bronze Bearing Metal £120 per ton  
CASTINGS, Wire Ropes, Tuyeres, &c., of all descriptions executed at the shortest notice.

### ASHWORTH'S IMPROVED STEAM RAM PUMPS.



AWARDED  
**First Prize  
MEDALS**

AT  
MIDDLETON,  
WORSLEY,  
OLDHAM,  
AND  
MANCHESTER AND  
LIVERPOOL SHOWS,  
September, 1874,  
For Neatness,  
Simplicity,  
and Efficiency.  
Useful to Mill-owners,  
Colliery Proprietors,  
Chemical Works,  
Paper Works, &c.

Single & Double  
**RAM PUMPS**  
of all sizes.

Full particulars on  
application.

**ASHLEY LANE, MANCHESTER**



# DYNAMITE

FOR BLASTING PURPOSES, can now be supplied in packages, containing 50 lbs. each, for export to any part of the World.

## Nobel's Dynamite, or Safety Giant Blasting Powder,

Is the CHEAPEST and MOST POWERFUL EXPLOSIVE for every kind of MINING and QUARRYING OPERATIONS; for blasting in hard or soft, wet or dry ROCKS; for clearing land of TREE ROOTS and BOULDER STONES; for rending massive BLOCKS of METAL; for SUBAQUEOUS and TORPEDO purposes; and for recovering or clearing away of WRECKES, &c.

ITS SAFETY is evidenced by the total ABSENCE OF ACCIDENTS in transit and storage; it is insensible to heavy shocks, its GIANT POWER being only fully developed when fired with a powerful percussion detonator, and hence its great safety.

As a SUBSTITUTE FOR GUNPOWDER its advantages are the GREAT SAVING OF LABOUR, rapidity and INCREASE OF WORK done, FEWER and smaller BORE-HOLES required, greater depth blasted, safety in use, NO DANGER FROM TAMPING, absence of smoke, unaffected by damp, &c.

For information, apply to the—

BRITISH DYNAMITE COMPANY (LIMITED), GLASGOW;  
OR AT THE

London Export Office, 85, GRACECHURCH STREET, LONDON, E.C.

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Makes 300 to 1000 Blows per Minute, as may be required, without  
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MR. GEORGE GREEN, Mechanical Engineer to the above Company, SUPPLIES MACHINES under the above Company's Patents for DRESSING all METALLIC ORES. Dressing-floors having these Machines possess the following advantages:—

1.—They are cheaper than any other kind in first outlay.  
2.—From 60 to 70 per cent. of the labour is saved.  
3.—Only about one-fourth of the space usually occupied by dressing-floors is required.

4.—The ore is made clean at one operation, and 5 per cent. of ores otherwise lost is saved.

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Mr. COULTAS DODSWORTH, of Haydon Bridge, writes, on the 15th January, 1874:—"I have just returned from the Stonecroft and Greyside Mines, where I have seen your 'Patent Ore Dressing Machinery' at work, with which I must say, I was highly pleased. It is decidedly the best machinery I have ever seen for the purpose, the results being as near perfection as possible, and I am quite sure its use in this case will be a very great saving to the company. No large mining establishment should be without your machinery, especially when labour is difficult to procure—a mere fraction of the hands being only required as against the old system, and the work is altogether much better done, and a great saving of ore effected. I have heard it said that your machinery is better adapted for poor than for rich ores, but from what I have seen to-day I am quite confident it will do for any kind of ore. I beg not only to congratulate, but also to compliment, you on the great success of your 'Patent Ore Dressing Machinery.' You may use this letter as you think proper."

Mr. MONTAGUE BRALE, Managing Director of the Cagliari Mining Company (Limited), says, on May 15th, 1873:—"I have much pleasure in speaking of the great efficiency of your 'Patent Dressing Machinery,' as erected by you at our mines at Rosas, in the Island of Sardinia. You will remember it has always been considered impossible to dress, or rather separate, the minerals our ores contain by machinery, but our captain assures me he gets a constant return of 76 per cent. of lead with the greatest ease, and I know by the returns we are realising the best market price. I consider this company is much indebted to you for the success you have achieved at so small a cost. It may interest you to know, from my experience in several of the British possessions, including the whole of the Australian Colonies, that my opinion is I have never seen any dressing machinery that can efficiently, and at so small a cost, dress, and separate metallic ores, however close the mechanical mixture may be, as yours. You can use this letter in any way you like."

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## THE MINING SHARE LIST.

BRITISH DIVIDEND MINES.									
Shares.	Mines.	Paid.	Last Pr.	Clos. Pr.	Total divs.	Per share.	Last paid		
1633	Alderley Edge, c, Cheshire*	10 00	...	3 1/4	12 1/2	0 50	Apr. 1874		
6000	Bampfylde, c, Devon*	1 00	...	3 1/4	0 20	0 20	June 1873		
5500	Blaen Cwmbach, c, Cardigan* (24 sh.)	3 10 0	...	...	...	...	...		
200	Botalack, c, St. Just*	115 00	...	...	...	...	...		
10000	Bronfloy, c, Cardigan*	1 7 6	...	...	...	...	...		
4000	Brookwood, c, Buckfastleigh	1 15 0	...	3 1/4	3 2 0	0 40	Nov. 1874		
3248	Cargill, c, Newlyn*	5 4 8	...	1 1/4	4 16 3	0 12 6	Oct. 1872		
6400	Cashwell, c, Cumbria*	3 10 0	...	...	...	...	...		
1000	Carr Brea, c, t, Illogan*	35 00	...	...	...	...	...		
6000	Cath. & Jane, c, Penrynendendroeth	5 00	...	...	...	...	...		
2450	Coch's Kitchen, c, Illogan*	20 4 9	...	...	...	...	...		
10240	Devon Gt. Consols, c, Tavistock*	1 00	...	...	...	...	...		
4296	Dolcoath, c, t, Camborne	1014 10	...	...	...	...	...		
6500	Drake Walls, c, t, Calstock	5 00	...	...	...	...	...		
10000	East Balaclaw, c, t, Sancreed*	1 00	...	...	...	...	...		
6144	East Cardross, c, t, Cleer*	3 14 8	...	1 1/4	...	...	...		
300	East Darren, c, Cardiganshire	32 00	...	...	...	...	...		
6400	East Pool, c, t, Illogan*	0 9 9	...	11 1/2	...	...	...		
1500	East Wheel Lovell, c, Wendron*	5 19 0	...	...	...	...	...		
6000	Emmott, c, t, Christow	0 7 6	...	...	...	...	...		
2800	Foxdale, c, t, Isle of Man*	25 00	...	...	...	...	...		
40000	Glasgow Carr, c, (30,000 £1 p. 10,000 15s. p.)	1 1/4	...	1 1/4	...	...	...		
16000	Great Laxey, c, t, Isle of Man*	4 00	...	11 1/4	...	...	...		
25000	Great West Van, c, Cardigan*	2 00	...	...	...	...	...		
6000	Green Wheel Vor, c, t, Helston*	40 15 0	...	...	...	...	...		
6400	Green Hurth, c, t, Durham*	0 6 0	...	...	...	...	...		
6000	Groggion, c, t, Cardigan*	2 00	...	...	...	...	...		
10240	Gunnislake (Clitters), c, t	5 5 0	...	1 1/4	...	...	...		
1024	Herodfoot, c, t, near Liskeard*	8 10 0	...	...	...	...	...		
18000	Hington Down, c, Calstock* (21 sh.)	8 10 0	...	...	...	...	...		
25000	Killarney, c, t, Tipperary	1 00	...	...	...	...	...		
400	Lisburne, c, Cardiganshire	18 15 0	...	...	...	...	...		
5120	Lovell, c, Wendron	0 10 0	...	...	...	...	...		
11000	Melindur Valley, c, Cardigan*	3 00	...	2 1/4	...	...	...		
9000	Miners Mining Co., c, t, Wrexham*	5 00	...	...	...	...	...		
20000	Mining Co. of Ireland, c, t	7 00	...	...	...	...	...		
12000	North Hendre, c, t, Wales	2 10 0	...	...	...	...	...		
2000	North Levant, c, t, St. Just*	12 20 0	...	...	...	...	...		
7000	Old Trebrugg, c, t, ordinary shares	1 00	...	...	...	...	...		
9000	Old Trebrugg, c, t, 10 per cent. pref.	0 10 0	...	...	...	...	...		
5604	Pen-an-drea, c, t, Redruth*	9 20 0	...	...	...	...	...		
6000	Penballa, c, t, St. Agnes	3 00	...	...	...	...	...		
4793	Penrith, c, t, Gwennap*	3 00	...	...	...	...	...		
6000	Phoenix, c, t, Linkinhorne*	4 13 4	...	...	...	...	...		
1772	Polberr, c, t, St. Agnes	15 00	...	...	...	...	...		
18000	Prince Patrick, c, t, Holywell	1 00	...	...	...	...	...		
1120	Providence, c, t, Lelant*	16 18 7	...	...	...	...	...		
2000	Queens, c, t, Holywell*	2 00	...	...	...	...	...		
10000	Roman Gravel, c, t, Salop*	7 10 0	...	12 1/2	...	...	...		
10000	Shelton, c, t, St. Austell	1 00	...	...	...	...	...		
612	South Carn Brea, c, t, Illogan*	2 16 0	...	...	...	...	...		
6000	South Darren, c, t, Cardigan*	3 6 6	...	...	...	...	...		
10000	St. Pr. Patrick, c, t, (8000 sh. issued)	1 00	...	...	...	...	...		
8711	St. Just Amalgamated, c, t	3 10 0	...	...	...	...	...		
12000	Tankerville, c, t, Salop*	5 00	...	...	...	...	...		
6000	Tinicroft, c, t, Pool, Illogan*	9 00	...	...	...	...	...		
15000	Trevel, c, t, Bodmin	2 00	...	...	...	...	...		
4000	Trumpet Consols, c, t, Helston*	7 10 0	...	...	...	...	...		
15000	Van, c, t, Llanidloes*	4 50	...	...	...	...	...		
3000	W. Chiverton, c, t, Perranzabuloe*	11 10 0	...	...	...	...	...		
612	West Wharf, c, t, Redruth*	27 3 9	...	...	...	...	...		
2048	West Wharf, c, t, Illogan*	27 3 9	...	...	...	...	...		
612	Wheel Basset, c, t, Illogan*	8 2 6	...	...	...	...	...		
2048	Wheel Jane, c, t, Kea	2 13 10	...	...	...	...	...		
4296	Wheel Kitty, c, t, St. Agnes	5 4 8	...	...	...	...	...		
896	Wheel Margaret, c, t, Uny Lelant*	15 17 8	...	...	...	...	...		
80	Wheel Owles, c, t, St. Just*	76 5 0	...	...	...	...	...		
6000	Wheel Russell, c, t, Redruth*	3 00	...	...	...	...	...		
10000	Wheel Russell, c, t, Tavistock*	1 00	...	...	...	...	...		
10000	Wheel Whisper, c, t, Warleggan*	1 00	...	...	...	...	...		
5000	Wicklow, c, t, t, Wicklow	2 10 0	...	...	...	...	...		

FOREIGN DIVIDEND MINES.									
Shares.	Mines.	Paid.	Last Pr.	Clos. Pr.	Total divs.	Per share.	Last paid		
85000	Alamillos, c, Spain*	2 00	...	...	...	...	...		
30000	Almudra and Tinto Consols, c, t	1 00	...	...	...	...	...		
20000	Australian, c, t, South Australia*	1 00	...	...	...	...	...		
10000	Battle Mountain, c, t, (6240 part pd.)	6 00	...	...	...	...	...		
16000	Birdseye Creek, c, t, California*	4 00	...	...	...	...	...		
6000	Bensberg, c, t, Germany*	10 00	...	...	...	...	...		
12200	Burra Burra, c, t, So. Australia*	5 00	...	...	...	...	...		
30000	Cape Copper Mining, c, t, So. Africa*	7 00	...	...	...	...	...		
40000	Cedar Creek, c, t, California*	5 00	...	...	...	...	...		
15000	Central American Association, c, t	0 16 8	...	...	...	...	...		
21000	Colorado Terrible, c, t, Colorado*	10 00	...	...	...	...	...		
71612	Don Pedro North del Rey, c, t	0 16 0	...	...	...	...	...		
93500	Eberhardt and Aurora, c, t, Nevada*	10 00	...	...	...	...	...		
2352	Eldorado, c, t, Nova Scotia*	10 00	...	...	...	...	...		
60000	Emma, c, t, Utah (25,000 fully pd.)	20 00	...	...	...	...	...		
10000	English and Australian, c, t, So. Aust.	2 10 0	...	...	...	...	...		
15000	Ferguson, c, t, California*	2 00	...	...	...	...	...		
80000	Flagstaff, c, t, Utah*	10 00	...	...	...	...	...		
25000	Fortuna, c, t, Spain*	2 00	...	...	...	...	...		
60000	Gold Run, c, t, Utah*	1 00	...	...	...	...	...		
60000	Kapunda Mining Co., c, t, Australia*	1 00	...	...	...	...	...		
20000	Last Chance, c, t, Utah*	5 00	...	...	...	...	...		
15000	Linares, c, t, Spain*	3 00	...	...	...	...	...		
7837	Lusitania, Portugal* (25 shares)	3 10 0	...	...	...	...	...		
15000	Mammoth Copperopolis of Utah, c, t	10 00	...	...	...	...	...		
18000	Mountain Chief, c, t, Utah*	10 00	...	...	...	...	...		
10000	Muskrat Mining & Ironworks, c, t	30 00	...	...	...	...	...		
10000	Portugal, c, t, France*	20 00	...	...	...	...	...		
100000	Port Phillip, c, t, Clunes*	1 00	...	...	...	...	...		
64000	Richmond Consols, c, t, Nevada*	5 00	...	...	...	...	...		
120000	Scottish Australian Mining Co., c, t	1 00	...	...	...	...	...		
112500	Sierra Buttes, c, t, California*	3 00	...	...	...	...	...		
40000	South Aurora, c, t, Nevada*	5 00	...	...	...	...	...		
2535000	St. John del Rey, c, t (25 stock and multiples dealt in)	275 288	...	...	...	...	...		
15000	Sweetland Creek, c, t, California*	4 00	...	...	...	...	...		
20000	Tollima, c, t, (6000 sh. are £5 f. pd.)	4 10 0	...	...	...	...	...		
5000	Westphalian, c, t, Prussia*	20 00	...	...	...	...	...		
18000	Western Andes, c, t, New Granada*	5 00	...	...	...	...	...		

NON-DIVIDEND FOREIGN MINES.									
Shares.	Mines.	Paid.	Last Pr.	Clos. Pr.	Last Call.				
20000	Anglo-Australian, c, t, Victoria*	2 10 0	...	...	Sept. 1872				
20000	Australian United, c, t, Victoria*	2 10 0	...	...	...				
30000	Bellavista, c, t, Peru* (210 shares)	10 00	...	...	...				
80000	Bela Tent, c, t, Bolivia*	5 00	...	...	...				
50000	Braganza, c, t, Brazil*	0 15 0	...	...	...				
15000	Camp Plover, c, t, Utah*	10 00	...	...	...				
15000	Cesena Sulphur Company, c, t, Romania*	10 00	...	...	...				
60122	Chontales, c, t, Nicaragua* (and 12,542 of £1 15s.)	2 00	...	...	...				
6000	Clifton, c, t, Colorado*	5 00	...	...	...				
10000	Crescent, c, t, Plumas County, California*	10 00	...	...	...				
100000	Culaba, c, t, Minas Geraes, Brazil*	0 17 8	...	...	...				
10000	Douglas, c, t, Georgetown, Col.	5 00	...	...	...				
85000	Excelsior Hydraulic Gold Washing Co., c, t, California*	5 00	...	...	...				
80000	Exchequer, c, t, California*	1 00	...	...	...				
85000	Frontino and Bolivia, c, t, New Granada*	2 00	...	...	...				
60000	General Brazilian, c, t, Brazil*	3 00	...	...	...				
10000	Goetzl Tunnel Co., c, t, Georgetown, Col.	1 00	...	...	...				
10000	Holcombe Valley, c, t, California*	1 00	...	...	...				
6000	Hornachos, c, t, (210 shares) Spain	9 00	...	...	...				
10000	Imperial Brazilian Collieries, Brazil*	5 00	...	...	...				
20000	Independence, c, t, California*	5 00	...	...	...				
20000	I. X. L., c, t, California*	5 00	...	...	...				
60000	Javali, c, t, Nicaragua*	2 00	...	...	...				
12000	Lancaster, c, t, Viacaya, Spain (22 shares)	1 12 6	...	...	...				
65000	London and California, c, t	2 00	...	...	...				
75000	Malabar, c, t, Colombia* (65000 issued)	1 00	...	...	...				
4000	Malaga, c, t, Spain*	10 00	...	...	...				
40000	Malpaso, c, t, Colombia* (10000 pref. shares, 15s. paid)	1 00	...	...	...				
12000	Menzenberg, c, t, Honnet, Germany*	5 00	...	...	...				
14000	Montague & Waverley Gold Quartz Crushing Co., c, t, So. Scot.	2 00	...	...	...				
6000	Monte Loreto, c, t, Italy*	5 00	...	...	...				
15000	New Pacific, c, t, Nevada*	0 19 9	...	...	...				
65000	New Quebrada, c, t, Venezuela*	5 00	...	...	...				
60000	New Rosario, c, t, Mexico*	1 00	...	...	...				
20000	New Zealand Land Company, c, t, Coromandel*	5 00	...	...	...				
10000	New Zealand Land, c, t	10 00	...	...	...				
20000	North American, c, t	4 00	...	...	...				
60000	Panulillo, c, t, Chile* (280000 debentures)	4 00	...	...	...				
80000	Pastorena United, c, t, Italy*	3 00	...	...	...				
20000	Rica, c, t, Colombia* (40000 issued)	1 00	...	...	...				
100000	Rio Tinto, c, t, Huelva, Spain	10 00	...	...	...				
100000	Rosa Grande, c, t, Brazil* (21 shares)	0 19 9	...	...	...				
32500	Ruby Consolidated, c, t, Nevada*	10 00	...	...	...				
30000	Russia, c, t, Orenburg and Ufa*	10 00	...	...	...				
25000	San Pedro, c, t, Chile*	2 00	...	...	...				
20000	Santa Barbara, c, t, Colorado* (new 10s. sh., 2s. 6d. pd.)	0 9 8	...	...	...				
10000	Silver Plume, c, t, Colorado*	1 00	...	...	...				